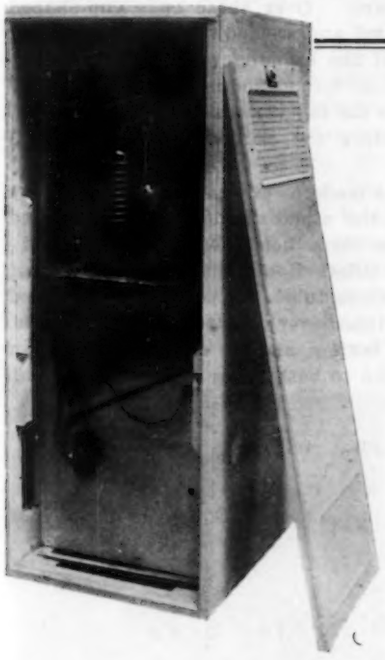
THE IRON AGE

New York, February 2, 1928

ESTABLISHED 1855

VOL. 121, No. 5



Stampings Welded Into Complex Units

Moderate Investment in Machines and Equipment Produces Compact, Efficient and Reliable Parts for Iceless Refrigeration Units

BY ALAN G. WIKOFF*

SOME notable achievements have been accomplished in recent years by firms making various kinds of domestic refrigeration units, not the least being the ability to compress in very small compass the necessary mechanical and chemical units, so built and assembled as to be entirely automatic in operation. Numerous makes are now marketed, the results of marked ingenuity by designer and constructor.

One interesting variety operates on the so-called gas-fired absorption system. The entire device is made of thin-walled tubing and sheet metal stampings, with all joints welded. In the diagram the various parts are sketched in the location and shape they assume in the completed unit, except that the condenser and the liquid heat exchanger are rectangular coils respectively at top and bottom of the boiler.

*Linde Air Products Co., 30 East Forty-Second Street, New York.

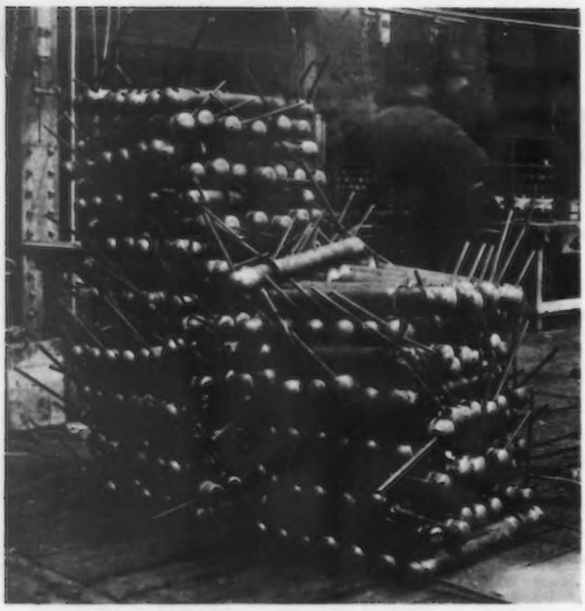
The whole system operates at about 15 atmospheres pressure, high enough so ammonia gas will liquefy at the temperature of the cooling water, which may be tepid. Therefore it is essential that the complex system of pipes and chambers be absolutely tight—a pin hole leak at any joint would speedily render the outfit inoperative. As observed at the plant of Servel, Inc., oxy-acetylene welding is used almost exclusively in the construction, because of its ability to make sound joints and to assemble complex devices from simple units.

Construction of Parts

A Servel unit consists of seven principal parts: Boiler *B*; absorber *A* and evaporator *E* (which are similar); condenser *C* and liquid heat exchanger *L* (which are pipe coils); rectifier *R;* and gas heat exchanger G.

Absorber *A* and evaporator *E* are made of sheet

Plant for Making Gas Absorption Refrigerator Units



STOCK of Gas Heat Exchangers, with Pipes for Delivering Liquid Ammonia from Rectifier to Evaporator Protruding from Either End

metal stampings. A wrapper sheet, properly punched for side openings, is closed into a cylinder and a longitudinal seam made. A series of self-spacing stampings, the trays, is then slipped inside and fixed in place by spot welding. Sheet metal cups welded on top and bottom form the domed ends.

Gas heat exchanger *G* is built as follows: Several pieces of thin-walled steel tubing, about ¼ in. in diameter, cut to length, are slipped into corresponding holes in end diaphragms, and expanded enough for a tight fit. A longer tube for liquid ammonia is threaded through the last open hole, the entire nest is pushed into a longer tube about 2½ in. in diameter, where it fits snugly, and the protruding ends of the ammonia tube are bent upward. Over these ends cup-shaped stampings are slipped and welded to the outer casing forming the ends of the exchanger. A flange is also welded to the casing for attaching the refrigerator partition. Openings for the various connections are, of course, punched before the individual parts are assembled.

The rectifier *R* is made of two pieces of tubing, one short and straight, the other smaller in diameter and bent into a U after three holes for connections have been punched in the sides. Round disks are welded over one end of each of these tubes. A series of perforated stampings is then slipped over one arm of the bent tube, spot-welded top and bottom, and the outer tube is put in place. A ring welded to both tubes closes the annular space at the bottom.

First Assembly

Assembly starts with the parts that have just been described. A coil of copper pipe for cooling water is

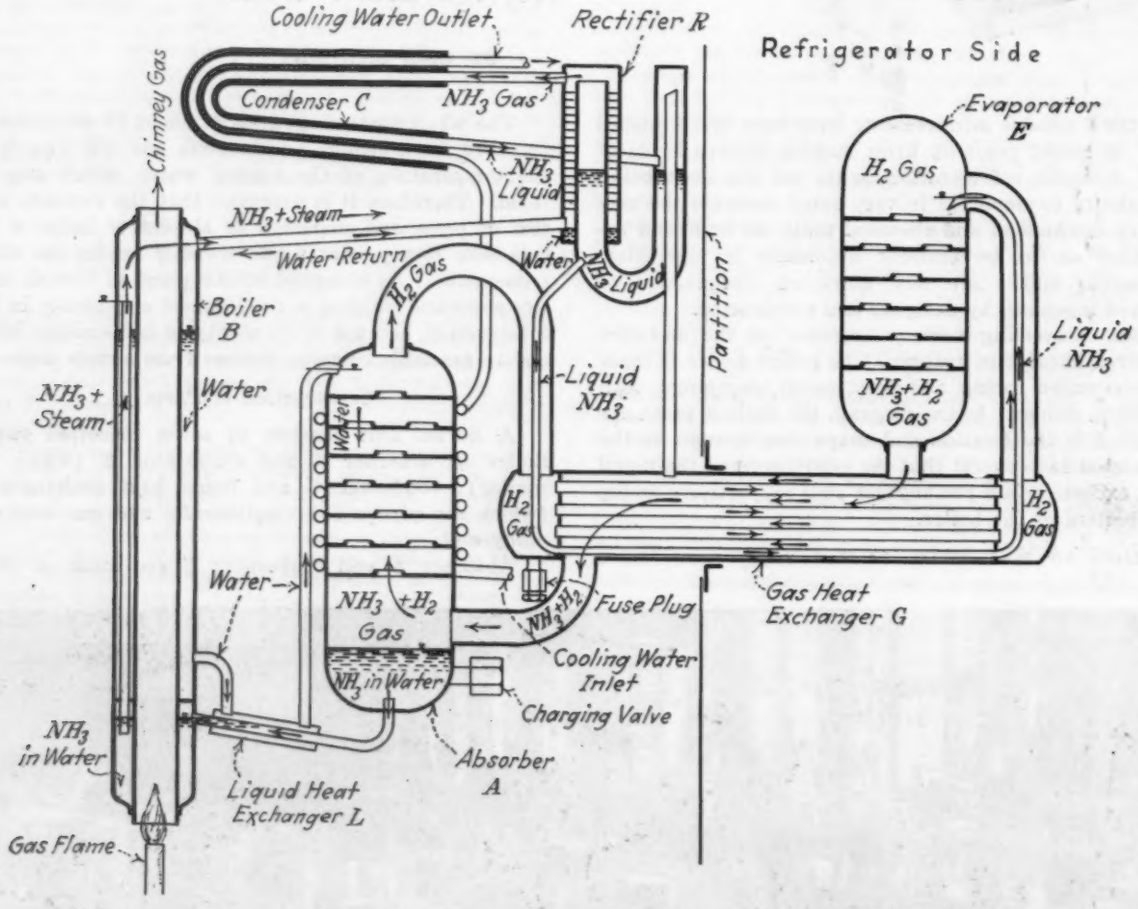


Diagram Showing Construction and Operation of Servel Unit

CONCENTRATED ammonia solution (NH_3 in water) in the bottom part of the boiler B on being heated drives ammonia gas (NH_3) and steam up through vent pipe at side of boiler across to rectifier R, where the steam condenses on the little shelves and trickles back into the top portion of boiler. Ammonia gas passing into the condenser C is cooled and liquefied, the liquid ammonia returning to the other leg of the rectifier R. From here it is piped to evaporator E, and, dripping from tray to tray, changes from liquid to gas, absorbing heat and thus cooling the refrigerator. The mixture of ammonia and hydrogen gas (NH_3 and H_2) in the evaporator E is heavy and settles into the absorber A by way of the gas heat exchanger G. In the absorber A, ammonia gas is washed out of the gas mixture by the water condensate overflowing from the boiler and trickling from tray to tray. Hydrogen gas (H_2) returns to the evaporator E.

slipped over absorber *A* and held in place by clips welded to the wall. Two curved tubes connecting absorber *A* and gas heat exchanger *G* are then welded and to this is added the evaporator *E*. An interesting work-holding fixture used for many of the assembly operations is a swivel vise mounted on a substantial pipe standard so it can be turned in any direction. With this arrangement the position of the work can be quickly changed by the operator with hardly any interruption to the welding.

Attaching the rectifier, using a jig, completes the first assembly.

What might be called the hydrogen circuit is now completely assembled. It is tested for tightness by closing with clamps and gaskets any openings to which connections will be made later, and subjecting it to 800 lb. per sq. in. air pressure. Every joint is painted with soap solution; absence of bubbles indicates tight joints. After receiving its O. K. the unit goes to the galvanizing and tinning department, where the refrigerator side up to the partition is galvanized. A heavy coating of tin is applied to the absorber condenser coil by dipping, for the purpose of increasing the metallic contact between copper water coil and the absorber. This insures more efficient heat exchange between the cold water and the gases inside the absorber.

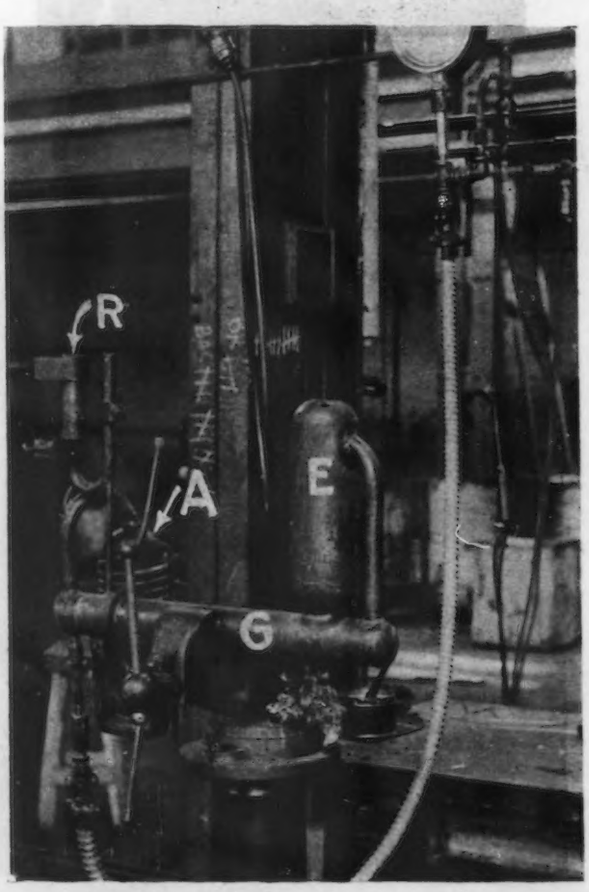
Coils

Liquid heat exchangers *L* are made simply by thrusting a small steel pipe through a larger one, welding the ends of the outer pipe to the inner, and bending them into a rectangular coil of about five turns. The condenser *C* is made as follows: A length of steel tubing to carry the ammonia and another of copper to carry cooling water are placed side by side and made into a rectangular coil of about three turns. It thus consists of alternate turns of steel and copper tubing, held together by steel clips tack-welded to the steel tubing. To increase metallic contact and thus give better heat transfer, the coil is dipped into molten tin which solders the pipes together. A strand of twisted copper wire is then placed in the space between adjacent coils and covered with soft solder applied with a welding blow-pipe.

Boiler *B* is a jacketed tube. Over the inner chimney is slipped a sheet metal washer or annular diaphragm, and welded on. A small diameter tube for carrying ammonia and steam from the lower compartment is

(Above) Operator Welding Connections Between Evaporator E and Gas Heat Exchanger G

(At Right) First Assembly Under Pressure Test. Openings in rectifier R closed by clamps and gasket



(At Left) Simple Work-Holder for Making Boiler

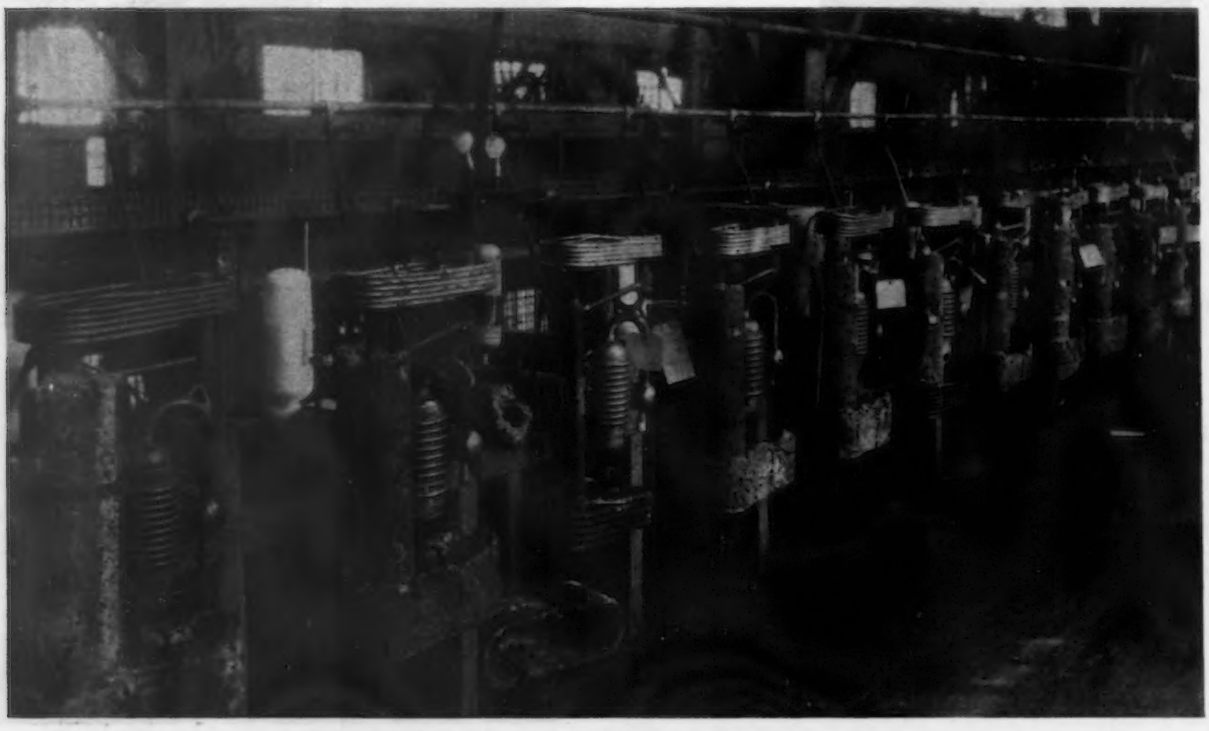
then thrust through a hole in the diaphragm and welded in place. Then one short and one long tube, each with one end swaged down, are slipped over the

Completed Unit. (This picture is printed upside down to place the various parts in working position)

The unit is now ready to receive its charge of refrigerating agent. The air is first removed by a vacuum pump. The required volume of ammonia solution of known strength is then introduced, a three-way cock turned and enough hydrogen gas admitted to register the correct pressure on the gages. The charging valve is then closed and sealed.

After placing insulation loosely around the generator and liquid heat exchanger, the unit is placed on the cold test rack, a gas burner is inserted at the bottom of the generator, connections for circulating water are made to the condenser coil, and temperatures developed on the refrigerating side recorded.

Subsequent assembly operations are of interest. The first step is to place an aluminum casting over the evaporator end of the unit. This casting forms the cooling compartment of the refrigerator and has shelves for the insertion of the trays used in making ice cubes. The unit is then mounted on an insulated board that forms the partition separating the cold part of the refrigerator from the section that contains the heating element. The generator and liquid heat exchanger are then covered with a very heavy layer of heat-insulating material. After being sprayed with a coat of paint and placed in the ice box, the gas burner, thermostat and connections for gas and water are attached. The burner is so designed that the gas will be turned off automatically should the flame be accidentally extinguished. The unit is then given a final cold test, a careful record



Servel Units Under Operating Test Before Installation in Cabinets

chimney until they butt against the diaphragm. One weld then makes a solid joint between diaphragm and jacket, and two others close the ends of the jacket.

Final Assembly and Test

Boiler and coils are then welded to each other and to the first assembly by short pieces of connecting tubing, when the complete unit is ready for proof test at 800 lb. air pressure. While this allows a liberal factor of safety over the normal working pressure, it does not even approach the ultimate strength of the unit, which can withstand over 3000 lb. per sq. in. hydrostatic pressure before failure. This is an indication of the uniformly high quality of material and workmanship maintained throughout this plant.

being kept of the temperature in the cooling compartment of the refrigerator.

Purchase of United States Can Co. by Continental Approved

Stockholders of the United States Can Co., Norwood, Ohio, at a meeting on Jan. 21 voted to accept the offer of the Continental Can Co., Inc., New York, whereby the latter company will take over all of the assets, properties and goodwill of the United States company, the transaction to be effective Feb. 7.

The Continental company has also acquired the Seattle Astoria Iron Works, Seattle, Wash., manufacturer of can making and allied machinery and equipment.

Accurate Control of Rolling Speeds

Introduce Many Operating Economies in New Ten-Inch Merchant Mill Built for Bourne-Fuller Co.

UNUSUAL provision has been made in the new electrically driven 10-in. merchant bar mill at the Union Works of Bourne-Fuller Co., Cleveland, for close regulation of rolling speeds, resulting in less frequent roll changes. Furthermore, it is not necessary to keep as close watch on roll diameters as it would be with constant-speed drive, because when a roll is turned down and slightly reduced in diameter, the speed of the stand can be increased to compensate for the change. No roll changes are necessary in rolling sizes from 7/32 in. to ⅝ in. in round bars or equivalent sections in squares and flats. Mill stands have one-piece semi-steel housings. When rolls are to be changed the entire housing is lifted by crane and taken to the set-up stands. It is claimed that a one-piece housing makes a more solid mill.

With the speed of the finishing train under close control, the lengths of the loops as the steel passes from one stand to another may be so short that light sections have little chance to chill. There is also no time wasted in passing the steel through the four sets of rolls. The mill has been operated at a delivery speed of 1600 ft. per minute when rolling ½-in. rounds, but it is expected that this speed will be increased somewhat. This high speed also helps to prevent chilling of small sections.

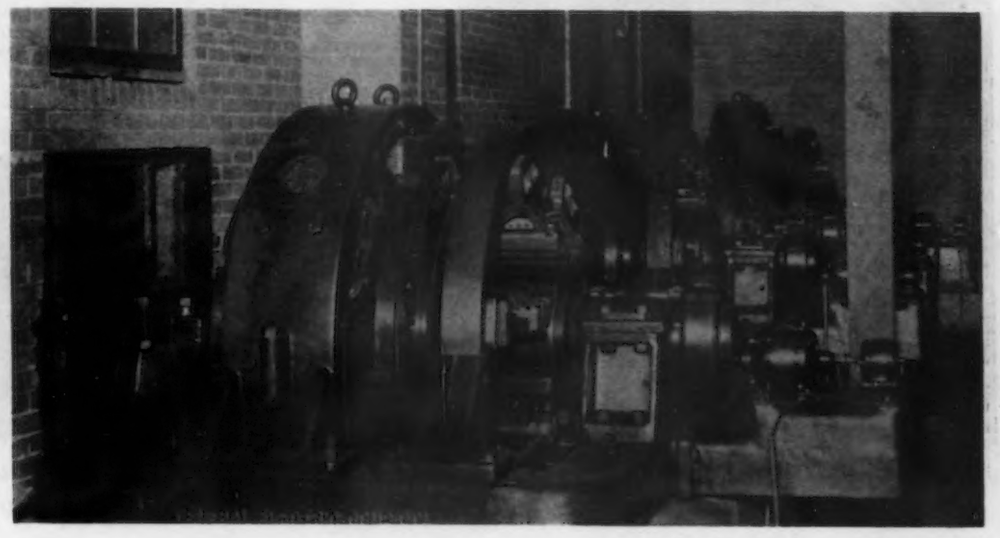
The mill is designed for rolling both alloy and plain carbon steel bars. It produces strip, bands, angles and spring steel in straight lengths and coils. The mill will specialize on bars for cold drawing and for nut stock. It replaces two old merchant bar mills, an 8-in. and a 10-in. mill. It will roll rounds from 7/32 in. up to 1¼ in. and corresponding sizes in squares, hexagons, flats and ovals, although it is not the intention to produce sections larger than ¾ in.

The new mill is semi-continuous, with two groups of four stands of roughing rolls arranged in tandem, and four finishing stands. The first four roughing stands are driven by a single motor. The second group of roughing stands have individual motor drives. Three motors drive the finishing rolls.

Heating Furnace Has Suspended Roof

Billets from 3½ in. down to 1½ in. square in lengths up to 30 ft. are used, and as a rule these are not cut to shorter lengths on leaving the reheating furnace. Instead, the billet is reduced in its full length in one piece, and finished bars that go to the hot bed are cut to length by a flying shear. Bars that are coiled are not cut, but coiled their full length. The new heating furnace is 32 x 32 ft. and fired with producer gas. Billets are charged endwise into the side of the furnace over a table having rollers mounted in roller bearings. Inside the furnace the rollers are water cooled and operated by motor-driven worm gears. Billets are pushed sidewise through the furnace on skids, not water cooled.

The roof is entirely supported by structural steel members located along the sides of the furnace, a construction which permits side wall repairs without dis-



INDIVIDUAL Drive Motors on Roughing Stands Nos. 5, 6, 7 and 8 Are Placed Close Together and Speed Set as Desired Is Maintained by Electrical Interlock

turbing the roof. Air, but not the fuel, is preheated by passing through regenerative chambers. Reversal of the flue gases is done at intervals by water-cooled sliding dampers and mushroom valves. Hot billets are discharged by an ejector gripped by motor-driven pinch rolls, the bottom roll being raised and lowered by an air cylinder. The furnace was designed by Oliver Luetscher, Peru, Ind., and, excepting the auxiliary equipment, was built by Bourne-Fuller Co. Small mill-type direct-current motors for this and other equipment were furnished by Westinghouse Electric & Mfg. Co.

Eight Roughing Mills in Two Sets of Four

The end of the heated billet, when pushed from the furnace, is gripped by motor-driven pinch rolls that deliver it to the first roughing stand. An up-and-down shear is located between the furnace and first roughing rolls, but, as previously stated, billets are usually rolled full length.

The roughing mill is continuous, eight stands in tandem, each with 12-in. rolls. The first four stands are driven by one 500-hp. motor with a combination bevel gear and pinion drive, thus avoiding the use of spindles. The motor drives through a gear reduction set and double flexible Fast couplings, one 15 ft. and the other 9 ft. in length, to a line shaft. Bevel gears on this shaft mesh with bevel gears on the ends of the pinion shafts. Several advantages are claimed for this arrangement: (a) floor space is saved by making the mill stand a compact unit, (b) backlash is avoided and (c) the usual lost motion in the coupling box is eliminated. The long coupling was used so the motor could clear an existing building column.

The second group of four 12-in. roughing stands are driven by individual motors (as shown in the illustration) through gear reduction sets. These mill stands are on unusually close centers for individually driven units designed to roll small sizes, but are spaced farther apart than most continuous group-driven mills for small merchant bars and rods. Stands Nos. 5, 6 and 7 are driven by 300-hp. motors. Stand No. 8 requires a 500-hp. motor, because a heavy draft is taken here when rolling spring steel, angles, flats and some special sections. All mill motors and control equipment were furnished by General Electric Co.

Three Motors Drive Four Finishing Stands

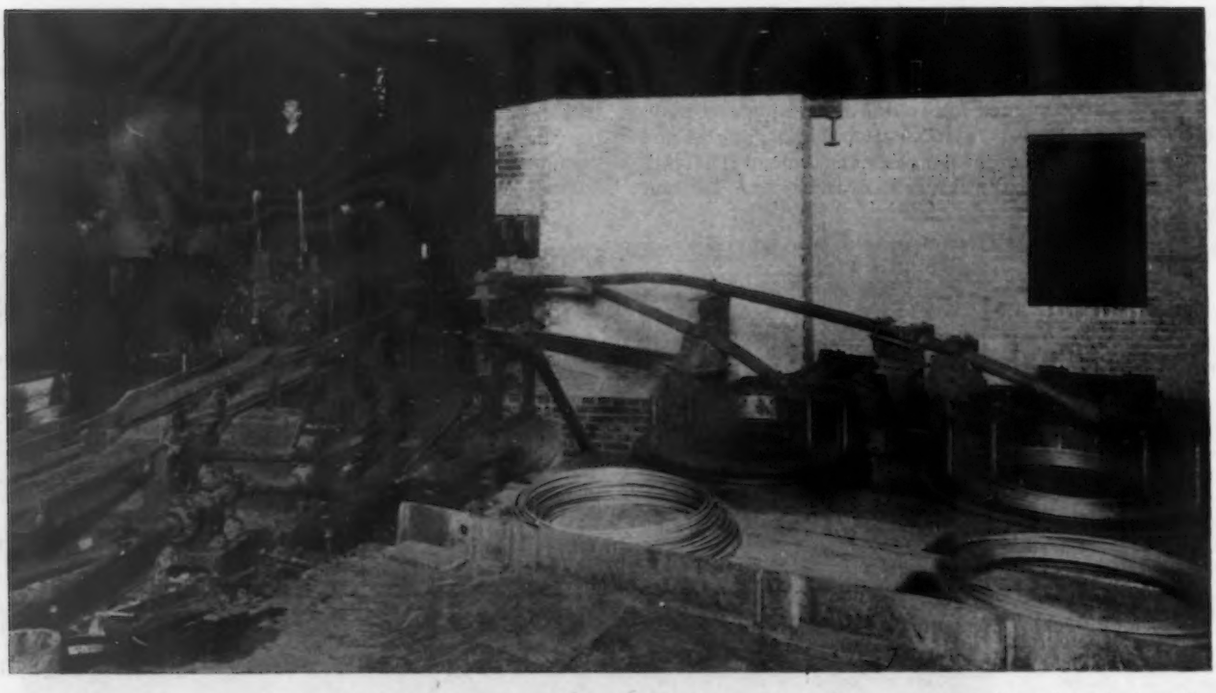
The finishing mill consists of four 10½-in. looping stands. Stands Nos. 9 and 10 are driven by one 500-hp. motor and stands Nos. 11 and 12 are individually driven by motors of the same rating. The first three stands are located side by side. Stand No. 12 is set back of the others, because sufficient space was not available for the driving motors. A repeater is usually used for delivering the steel from No. 8 to No. 9 stand and a repeater will also be placed between stands Nos. 10 and 11.

Unique Speed Control

Each mill motor has an individual magnetic control panel so any one stand can be started or stopped. A unique method is used for regulating the speeds of the four motors that drive Nos. 5, 6, 7 and 8 stands. When each of these stands is driven at the proper speed, the bar as it passes through the rolls is kept under tension but not stretched or looped. Because of the close centers, speed is controlled by a synchronous tie between the motors, which in reality takes the place of interlocking gears. It is obtained by individual balance-type vibrating speed regulators, which not only maintain a synchronous tie among the four motors, but also maintain the correct speed set for each motor within close limits. This speed-regulating equipment may be taken out of service by the operation of a transfer switch and the motors placed under hand control.

Control of the whole mill is from a house at the side, whence the operator has a good view of all the stands. This house is on the mill floor level, due to insufficient head room to permit the usual elevated pulpit. The control board, shown in the head piece of this article, is of the bench board type. There are two methods of speed regulation, one through the regular motor speed adjustment for large differences in speed, and the other through a field rheostat, which is used for making finer speed adjustments. A rheostat is located beneath each motor.

The control board is equipped with an ammeter for each motor to indicate the load carried, a tachometer to indicate the speed and a master switch for starting and stopping. Separate mill speeds are scheduled for every size of bar being rolled. Knowing the size of the section, the operator sets the controls to secure the predetermined speeds and with the field rheostat makes minor speed variations as necessary. This applies particularly to the second roughing set, in which the bar is passing through all four stands at one time and a slight variation from the proper speed of any one



Bars for Coiling Are By-passed to Right. Flying shear directly in front of operator cuts long bars in lengths which can be handled on cooling bed

Runout with Automatic Cooling Bed at Right, and Facilities for Pack-Annealing Spring Steel at Left

stand will cause the steel either to buckle or stretch.

Direct current for driving the mills and various auxiliary equipment is derived from two motor-generator sets made by General Electric Co. Each consists of a 1000-kw., 250-volt, direct-current generator driven by a 1400-kva., 2300-volt synchronous motor with 80 per cent power factor. The motor-generator sets and the motors that drive the roughing stands and Nos. 9 and 10 finishing stands are located in a motor room at the side of the mill. The individual motors that drive stands Nos. 11 and 12 are located in the control room on the opposite side of the mill. All mill motors are the same type and have a speed range of 267 to 800 r.p.m.

Automatic Control Beyond Last Finishing Pass

Movement of the bars is automatic from the time they leave the last finishing stand until they reach the bar shears. A control on the runout table kicks the bar to the flying shear, a second control delivers the bar from the runout table to the hot bed, and when it drops on the first notch of the hot bed the latter is set in motion. A control pulpit is located at the side of the hot bed, but the only duties of the attendant are to watch the movement of the steel and operate control levers should any of the automatic controls fail.

The flying shear located at the delivery end of the last finishing stand is of the Rendleman type and consists of two circular cutters rotated by two adjustable-speed motors. Another motor raises and lowers the upper cutter. Cutters are set at an angle of 45 deg. to the line of travel, the bar is moved sideways through a swinging trough until it is caught in the cutter blades, and the bar is sheared while in motion at any delivery speed. The shear has a capacity for cutting 1-in. rounds and squares, or flats up to ⅝ x 4 in.

Bars that are to be coiled are not sheared but diverted from the finishing mill runout to one or two motor-driven reels. Reels are of the pouring type, and coils are pushed off mechanically to a conveyor leading to the storage building. An overhead traveling crane then places the coils in cars or in piles on the floor. Material is usually reeled into 300-lb. coils, although the coilers have a capacity of 500 lb. Two strip coilers with motor-driven reels are also provided for coiling material rolled in strip sizes.

Straight bars from the last finishing stand are cut to length on the flying shear and carried on a double runout table to the hot bed shown in the view. This table has individually motor-driven rolls, synchronized with the finishing mill. Runout rollers and motors are equipped with roller bearings. From the runout table the steel is automatically discharged on the hot bed, 250 ft. long. It is of the double type, with 10 ft. notched bars on one side. A hand-type bed 12 ft. wide on the opposite side is provided for pack-annealing spring steel.

From the hot bed the bars are delivered to shuffle bars and run-off rollers, and thence to shears. There are three bar shears. One takes care of the hand bed. one the mechanically operated bed and the third is for shearing angles. A transfer table takes angles from the run-off rollers to a straightening machine before reaching the third shear.

The new mill was designed by N. K. Hartford, general superintendent Bourne-Fuller Co., and C. A. McDowell, superintendent of the Union Works. It was built by the United Engineering & Foundry Co., Pittsburgh, which also supplied the hot bed, tables, flying shear and other mill equipment.

Rates on brass, bronze and copper articles from Baltimore to points in Official Classification territory are not unreasonable, according to a proposed report made recently to the Interstate Commerce Commission, Washington, by Examiner E. P. Hurley. Complaint was made against the rates by the Baltimore Tube Co., Inc., Baltimore.

Freight car requirements for iron and steel products in the first quarter of 1928 will amount to 466,363 cars, according to an estimate by the car service division of the American Railway Association. Actual requirements during the first quarter of 1927 were 472,495 cars, the association's estimate being a decrease of 1.4 per cent.

New Plant Widens Scope of Output

Chicago Foundry Now Makes Greater Variety of Non-Ferrous Castings—Some Economies in Handling Materials

INCREASE in plant capacity, a broader field for its products, larger sizes of individual castings and heats from a wider range of non-ferrous metals, are the major results obtained by abandonment of an old plant and construction of a new foundry and machine shop by the Hills McCanna Co., 2349 Nelson Street, Chicago.

The property acquired for the new project is now about one-half under roof, affording space for a large expansion of output. Comparatively speaking, individual shipments from this plant will always be small in tonnage, therefore switch track facilities have not been provided, and incoming materials and products are trucked to and from the plant.

The foundry is a brick and steel structure, 66 ft. wide by 200 ft. long, with roof trusses spanning from wall to wall without intermediate columns. The furnace room is separated from the molding room by a brick wall. Eleven oil-fired furnaces are now installed and operating and space remains for the addition of five units. The furnaces are designed for 200-lb. pots. The melting time varies from 55 min. to one hour.

The foundry floor is divided down the center by a main aisle, on either side of which are the molding skids. On both sides of this aisle, near the furnace room, are the light casting floors. Equipment installed at that end of the building includes standard types of molding machines, a Pridmore stripper, two electrically operated sand riddles and a sand mixer. Small molds are made in steel flasks furnished by the Sterling Wheelbarrow Co., Milwaukee, Wis. In all there are 21 molders' stations on small work and two molders are employed at the heavy casting pit. The floor is made of concrete except where the large molds are made.

The heaviest individual casting poured to date weighed 3400 lb., but with the additional furnaces which may be installed in the future it will be possible to produce castings weighing 6000 lb. each.

On one side of the aisle is the core room and the core ovens, and directly opposite are the gate and riser cutting-off machines and the sand-blast equipment. The day core oven is designed with six drawers, each 3 ft. x 6 ft., and the night oven, which is loaded by a truck that is moved in and out of the furnace on a track, measures 8 ft. x 10 ft. inside. These ovens are oil-fired and may be operated simultaneously or separately as occasion demands. They were built by the Foundry Equipment Co., Cleveland. Two band and two hack saws constitute the gate cutting equipment. Castings are cleaned in a revolving barrel sand blast machine installed by the American Foundry Equipment Co., Mishawaka, Ind.

A duorail system for handling materials extends from the furnace room over the center aisle to the far end of the main foundry room. One 5-ton and two 1-ton hand-operated overhead cranes traverse the molding room on one side of the aisle, and a 1-ton crane of the same type operates over the molding floors on the opposite side of the aisle. The 5-ton crane is installed over the heavy-work pit. The 5-ton crane cannot travel beyond the limits of that pit, but the 1-ton cranes on that side of the aisle can be moved over the track that serves the 5-ton crane. The equipment was furnished by the Atlas-Chicago Co., Chicago. Hot metal is delivered from the furnace room to the desired location in the center aisle by the duorail system and it is then transferred to one of the hand-operated cranes.

On leaving the foundry the visitor goes through the shipping department, past the pattern storage, the assembly benches and the tool room to the machine shop, which is a well lighted and ventilated room, 66 x 200 ft. Of special note is the width of the aisles and the distance between machines. Much of the equipment was moved over from the old plant. Three new machine tools and a heavy-duty turret lathe were installed.

Castings are placed in elevated boxes in the foundry and moved by lift trucks, that were built by the Barret-Cravens Co., Chicago, to the machine shop and finally to the store room. A monorail system extends from the store room to the shipping department.

Melting furnaces, core ovens and the central heating plant are furnished with fuel oil from a central pumping station. All oil burners, pumps and auxiliary equipment were furnished by the North American Mfg. Co., Cleveland. A low-pressure boiler furnishes steam to the oil heater and the unit heaters in the shop. Each of the two oil pumps is rated at 200 gal. per hr., and the oil pipes are so arranged and by-passed that either or both pumps may draw oil from one or the other of two storage tanks. The oil pressure is maintained at 50 lb., and its temperature is raised to 100 deg. Fahr. The oil lines to the burners in the plant are so laid out that there is a constant circulation of hot oil, the return or overflow connection being made to the storage tanks. An oil-fired auxiliary hot water heater, which is connected with the oil heater, is installed for use when the low-pressure boiler is out of service. A Nash Engineering Co., South Norwalk, Conn., vacuum pump is located in the radiator return line to the boiler. The Dwyer Equipment Co., Chicago, furnished the overhead, fan-equipped unit heaters that distribute warm air throughout the various shop departments.

This plant is equipped to handle the more difficult non-ferrous metals, specializing particularly in aluminum-bronze; various nickel mixtures, including Monel and copper; nickel, iron and chromium alloys that find use in special fields. Complete service, from the making of patterns to the completely cast and machined part, is available. This company makes no effort to specialize in ordinary red brass jobbing work. Design and construction of this plant were supervised by Frank D. Chase, Inc., Chicago, engineers.

Why Steel Hardens

A handsomely printed brochure has been issued by the American Society for Steel Treating, Cleveland, containing the second Edward DeMille Campbell memorial lecture, by Dr. Zay Jeffries, entitled "A Contribution to the Theory of Hardening and the Constitution of Steel." The lecture was very briefly abstracted in THE IRON AGE'S report of the Detroit convention of the society, contained in the issue of Sept. 29, 1927, page 867.

Departments in a New Chicago Foundry

WIDE Aisles and Liberal Passageways Between Machines Facilitate the Rapid Movement of Products by Means of Lift Trucks

SPECIAL Machinery Makes Short Work of Gate and Riser Cutting. The sand blast equipment is near at hand

MONORAIL Systems and Overhead Cranes Eliminate Much Hand Work. The shop is warmed by unit heaters located along the walls and above the workmen's heads

Prices of Steel and Other Products

Metals Lower Than Most Other Commodities — Changes in Past Year—Probable Future Course of Prices

BY SIDNEY G. KOON*

DURING the past year there was a fairly steady drop in prices of pig iron and finished steel. At the same time, there was a moderate drop in prices of commodities in general, as reported by the United States Bureau of Labor Statistics. The situation was a little mixed, however, by reason of the fact that a number of the commodity groups reported upon by the bureau showed considerable increases during the year—enough, almost, to offset the declines made in other groups.

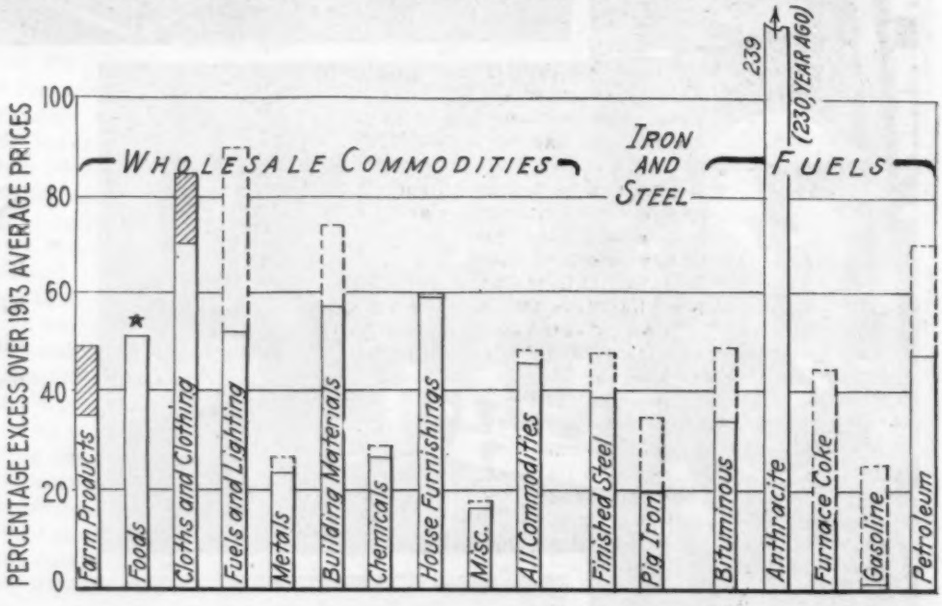
Again, as in many cases when these studies have been published† in the past, we find the metals at a much lower level relative to pre-war than are most of the other commodities. Thus steel beams are only 20 per cent higher than in 1913, whereas building materials in general are 57 per cent higher, clothing is 85 per cent and house furnishings are 59 per cent higher, and commodities in general are 45½ per cent higher. In some instances the divergences are much greater than this. Brick is more than twice the 1913 price. Potatoes are about six times as high as they were 15 years ago. Milk, building lime, worsted suitings, cotton sheeting and women's shoes are about double the 1913 level, while anthracite is more than three times as high as it was at that time.

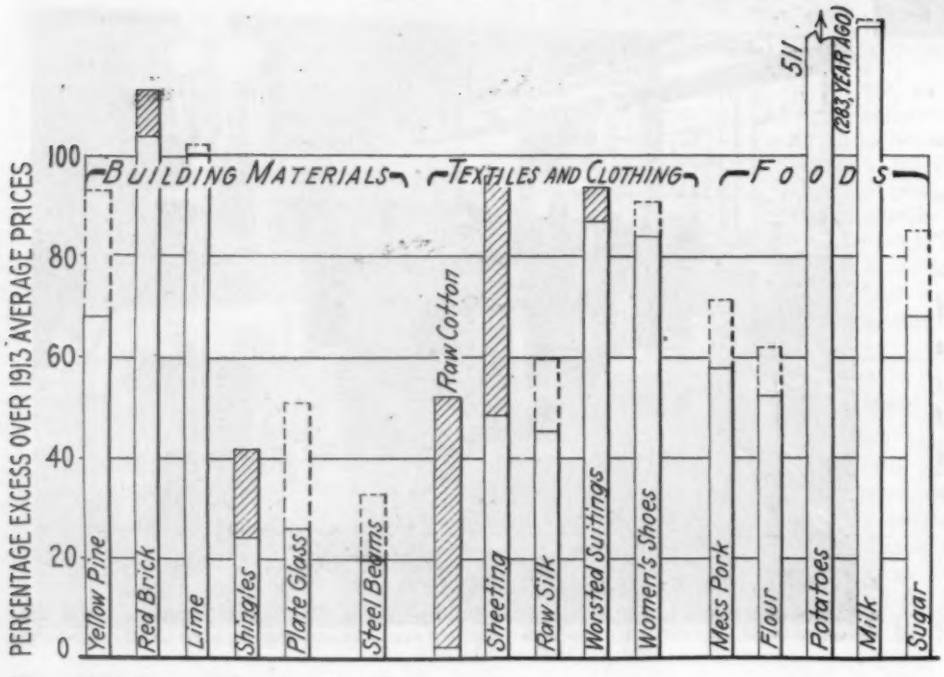
Without regarding 1913 as essentially correct in its

*Associate editor, THE IRON AGE, New York.

†See THE IRON AGE of Jan. 13, 1927, page 142; July 2, 1925, page 8; Jan. 1, 1925, page 46; June 26, 1924, page 1870, Jan. 3, 1924, page 108, and several earlier dates.

Prices of "All Commodities" Have Lowered Since a Year Ago, as Shown by the Dotted Top of the Column. Finished steel, a little lower than the general average, is below last year. Items with cross-hatching are higher than a year ago, to the extent of the hatched area. Foods show no change. Metals are among the lowest priced items of all





Steel Beams Are Only 20 Per Cent Higher Than in 1913; But All the Other Items in This Diagram (Left) Are From 42 to 511 Per Cent Higher. Brick, shingles, cotton, sheeting and suitings are now above the prices of a year ago, as shown by cross-hatching. Dotted tops of columns indicate that last year's prices were higher than now

relationship of prices of various commodities, the changes which have taken place since then are shown in the diagrams and on the table. That year has formed a standard basis of comparison for a long period of time and gives us a logical relative by which we can compare prices of products differing greatly in characteristics. It is on that basis, therefore, that the present figures and those of a year ago are studied.

Changes in the Past Year

DURING 1927 there was a reduction in prices of four of our five items in the fuel group and an increase in the other one. There was a reduction in prices of three items of our building material group and an increase in the other two. There was a reduction in prices of two of our textile and clothing group and increases in the other three. There was a reduction in prices of four of our food items and an increase in the other one.

Thus the trend is difficult to define, except by use of the weighted average of the Bureau of Labor Statistics. That average one year ago stood at 148.1, compared with 145.5 now, both being based on 100 as the average of 1913. Thus the decline has averaged a little under 2 per cent. Corresponding with this there has been a reduction of nearly 12 per cent in pig iron, of 10 per cent in steel beams, and of about 5½ per cent in finished steel. Both the pig iron and the finished steel figures represent THE IRON AGE composite prices.

Aside from the labor statistics price indexes, which are in index form only, all other prices in the table are quoted both in money values and in indexes based on 1913 averages. Consequently there is opportunity to relate each item to each other item, as may be desired, in studying the movement of these typical commodities. Twenty-three items are compared, in addition to the ten indexes of the bureau. These items cover several principal groups of products and each in itself is typical within its own group.

Prices quoted are drawn from a variety of sources, including market reports of trade publications and official reports from Washington. Steel beams, finished steel, pig iron and furnace coke are taken from THE IRON AGE weekly quotations. All of the prices have been translated into three diagrams, two of which show the individual items. These indicate not only the relation of present prices to those of 1913, but also their relation to those of one year ago.

These two diagrams are based on the excess of their several prices over those of 1913. A shaded area at the top of a column indicates that today's price is higher than that of a year ago. The excess is measured by the height of the area shaded. Where today's price is lower than a year ago, that fact and its extent are shown by dotted lines, above the solid lines which represent the relation of the present price to that of 1913.

Steel Prices Well Liquidated

IN the third diagram the history of prices of certain groups of commodities, together with steel beams, is traced across a period of several years. Both finished steel and steel beams are considerably lower than the all-commodity group of the bureau. They were higher for a time in 1923 and 1924, but otherwise have been continuously lower and usually considerably lower (except that the finished steel composite was just above the "all-commodities" level at the break of 1926-27). They are still further below the reported prices of building materials and clothing materials.

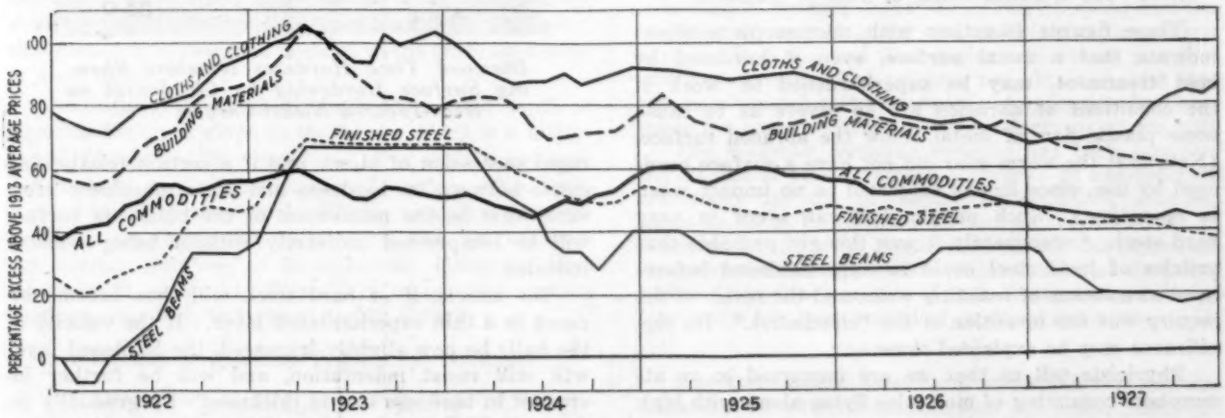
It follows that the prices of finished steel, and particularly the price of steel beams, have been more nearly liquidated than have the prices of most other commodities. They have been consistently lower than many of the materials covered in the survey, but this has been in large measure at the expense of profits.

Taking up some of the separate items, we find fuels, except for gasoline, ranging from 14 to 239 per cent above 1913. Gasoline is up only 1 per cent. Building materials are higher than pre-war by percentages varying from 26 to 113. Textiles and clothing prices exceed those of 1913 by 45 to 96 per cent. Foods are higher than in 1913 by margins varying from 52 to 511 per cent.

Little change has occurred in the level of the all-commodities figure in nearly six years. Since April, 1922, it has not once been below 144, nor above 161. During the 68 months its average level has been about 152. The latest available figure, that for November, is about 4 per cent less than the average. At no time

RELATIVE PRICES OF MANY MATERIALS

Item	Prices Quoted: Average, 1913	One Year Ago	Recent Figure	Index Number (1913=100): Peak, 1920	Recent Figure
Farm products	100	134.6	....	247	148.4
Food, etc.	100	151.1	....	248	151.0
Cloths and clothing	100	169.9	....	346	184.6
Fuels and lighting	100	190.2	....	281	151.8
Metals and metal products	100	126.5	....	203	123.2
Building materials	100	174.0	....	300	157.4
Chemicals and drugs	100	128.5	....	213	126.1
House furnishings	100	159.9	....	275	159.4
Miscellaneous	100	117.7	....	208	116.6
All commodities	100	148.1	....	247	145.5
Finished Steel	1.663c.	2.453c.	2.314c.	239	139
Pig Iron (composite)	$14.70	$19.88	$17.59	325	120
Steel Beams	1.50c.	2.00c.	1.80c.	207	120
Fuels:					
Bituminous coal	$1.34	$2.00	$1.80	746	134
Anthracite	3.82	12.62	12.94	209	339
Furnace coke	2.41	3.50	2.75	735	114
Penna. petroleum	1.79	3.05	2.65	341	148
Gasoline	16.8c.	21.0c.	17.0c.	185	101
Building Materials:					
Yellow pine	$28.50	$55.00	$48.00	237	168
Red brick	6.56	13.86	13.97	333	213
Lime	4.43	8.96	8.85	268	200
Shingles, red cedar	1.97	2.43	2.79	334	142
Plate glass	31.8c.	48.0c.	40.0c.	258	126
Textiles and Clothing:					
Raw cotton	12.84c.	13.05c.	19.45c.	341	152
Sheeting	7.3c.	10.8c.	14.3c.	390	196
Raw silk	$3.65	$5.84	$5.30	445	145
Worsted suitings	1.38	2.59	2.68	392	194
Women's shoes	2.17	4.15	4.00	380	184
Foods:					
Mess pork	$20.93	$36.00	$33.00	225	158
Flour	4.62	7.50	7.00	352	152
Potatoes	61.4c.	2.35	3.75	721	611
Milk	3.5c.	7.9c.	7.87c.	243	225
Sugar	3.46c.	6.4c.	5.8c.	536	168



Six Years of Price Changes in Finished Steel and Steel Beams, Compared With Cloths and Clothing and Building Materials, and With the General Average of "All Commodities" Reported by the United States Bureau of Labor Statistics

during the six years has the level departed by more than 6 per cent from its average.

Influences Affecting Future Prices

THOSE who look for a gradual subsidence of prices during the next quarter century base their opinions upon historical evidence. Such a course has been followed by prices during the years following every major upheaval of the past century and more. Well informed opinion, however, does not anticipate any steady or uninterrupted downward trend. That the trend will be downward is widely believed, but it is almost certain to be interrupted by minor humps in the curve, caused by various circumstances which are unpredictable.

Many commodities probably never will approach again the price level which obtained in 1913. Some things will reach that level or go below it. As a matter of fact, automobiles are below it today; so is rubber. Gasoline is close to it, and there have been periods since the war when steel beams have touched a figure lower than the average of 1913.

In general, however, the much enhanced labor and taxation costs following the war are expected to prevent a reduction in the prices of many commodities below levels considerably above those which formerly obtained. There is little expectation of a deflation or liquidation of labor prices. Much has been done in reducing labor costs per unit of product, but labor cost per hour of effort is likely to remain pretty close to its present level.

Costs per unit have gone down through a variety of influences. New methods of manufacturing have had their effect. New methods of management have been almost equally important. Methods of handling materials, improvement in design, improvement in characteristics of materials used, and in tools, all have been responsible for certain shares in the result. There is a definite point, however, beyond which savings of this character cannot proceed. In some respects and in some industries this point seems to be approached now. Standardization of product in other industries, however, may achieve great savings before many years have gone by.

In general, while prices of some commodities may show a slight tendency downward during the next few months, it is believed that there will be sufficient upward movement to offset, either wholly or in large part, the downward tendency of the other items. Steel prices in particular are believed to be lower with regard to other prices, and with regard to costs of production, than they should be. Whether this situation receives correction during the coming year remains to be seen. That is should be corrected, however, is easily discernible from earnings statements of companies.

Superhardening of Heat-Treated Steel

By Subjecting Them to Impact of a Cloud of Balls, Thus Producing a Work-Hardened Surface—Any Soft Spots Revealed by a Roughened Area

BY EDWARD G. HERBERT*

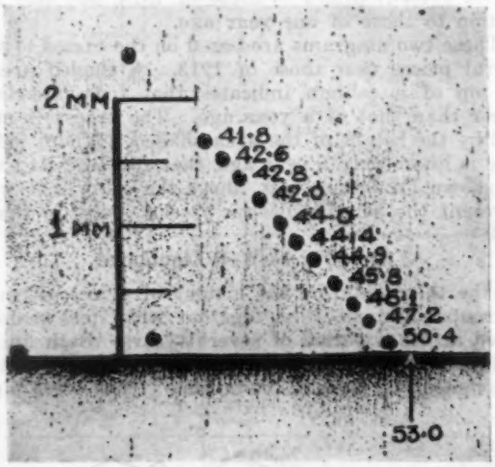
WHEN studying the work-hardened surfaces of railroad rails and locomotive tires, the author attempted to induce similar hardness under the ball of the pendulum hardness tester in the following manner: After the first test, the pendulum is tilted to the right, then to the left, then back to the vertical position, and a second hardness test is made on the same spot. Successive tests showed progressive increases in hardness up to a certain maximum, and thereafter a slow softening. A summary of results† on various articles follows:

	Original Hardness		Maximum Hardness Induced by Testing		Hardness of Surface of Worn Article	
	Herbert	Brinell	Herbert	Brinell	Herbert	Brinell
Locomotive tire	26.4	264	32.0	320	34.2	342
Rail	25.2	252	35.5	355	33.1	331
Clash gear (oil hardened)	36.3	490	57.1	771	58.5	790
Worm gear (case hardened)	49.4	667	82.2	1110	49.4	667
Cam (case hardened)	60.2	815	85.2	1150	86.0	1160

†Presented in a paper before the September, 1927, meeting of the (British) Iron and Steel Institute, entitled "The Work-Hardening of Steel by Abrasion."

These figures (together with microscopic studies) indicate that a metal surface, even if hardened by heat treatment, may be superhardened by work if the conditions of abrasion are so severe as to cause some plastic flow of metal below the abraded surface. (Note that the worm gear did not have a surface hardened by use, since it was subjected to no impact when in operation.) Such plastic flow can occur in very hard steel. Consequently it was thought probable that articles of hard steel could be superhardened beforehand as a means of resisting wear, and the result of the inquiry was the invention of the "cloudburst." Its significance may be explained thus:

Physicists tell us that we are immersed in an atmosphere consisting of molecules flying about with high velocity and constantly colliding with each other and with us. I will ask you to imagine an atmosphere whose molecules consist of small, hard, steel balls, flying about with high velocity and colliding with each other and with any object immersed in it. An article placed in such an atmosphere will be subjected to a rapid succession of blows, and if a certain relationship exists between its hardness and the atmospheric pressure—that is, the momentum of the balls—its surface will be compressed uniformly without being sensibly indented.



Diamond Time Hardness Numbers Showing Surface Hardening by Cloudburst on Heat-Treated Nickel-Chrome Steel

The article, if of hard steel, will thus become incased in a thin superhardened layer. If the velocity of the balls be now slightly increased, the hardened layer will still resist indentation, and will be further increased in hardness and in thickness. By gradually increasing the velocity of the balls, a superhardened layer can be produced, intensely hard on the surface and grad-

*Edward G. Herbert, Ltd., Levenshulme, Manchester, England.

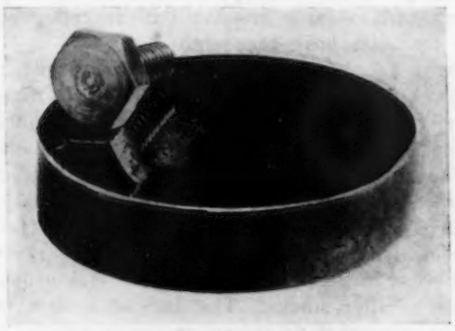
ually decreasing in hardness throughout its thickness, which may be about 2 mm. As there is no abrupt change of hardness there is no tendency for the layer to flake or scale off in service, a type of failure common in case-hardened articles. The actual hardness that can be thus produced depends upon the superhardening capacity of the steel, which is easily measured with the pendulum hardness tester, and the ball velocity required to produce this hardness can be determined by experience.

Method of Superhardening by Impact

For producing the steel ball atmosphere two methods have been employed. In one, the balls are caused to fall into the chamber from a height which can be varied. Continuous circulation of balls is maintained by means of an elevator and conveyor.

In the other method, the balls roll down a slight incline and are thrown in an upward direction by the vanes of a rotor whose speed can be varied, and with it the speed of the flying balls. After entering a rubber-lined chamber in which the work is placed, the spent balls again roll down the incline, thus maintaining a continuous circulation.

Just as there is a relationship between the original hardness of the steel and the initial ball velocity which compresses the surface without indenting it, so there is a relationship between the "maximum induced hardness" of the steel, as measured with the Herbert pendulum, and the final ball velocity which is sufficient to produce maximum hardness, but is insufficient to indent the superhardened surface. Any further increase of velocity would merely roughen the surface without increasing its hardness, and the whole superhardening process must therefore take place between these two limiting velocities.



Polished Mild Steel Disk Case-Hardened (Except for H on Top) and Superhardened. Process leaves mirror surface unharmed, but pits softer areas

The process can, of course, be applied to produce a work-hardened layer on any metal, by adjusting the initial and final ball velocities to its original hardness and its "maximum induced hardness." The fact that articles of very hard steel can be superhardened by working was discovered independently by Hultgren, who turned it to practical account in the superhardening of steel balls.

Quantitative measure of the hardness and depth of superhardening is given in the figure, which is a micrograph (magnified 20 diameters) of a section cut perpendicularly to the superhardened surface of a heat-treated nickel-chrome steel. Eleven pendulum test impressions are shown in a depth of 1.7 mm., and an average surface hardness of 53 is found. (Diamond time hardness 53 equals 715 Brinell.) The original surface hardness was 38.8, equivalent to 525 Brinell.

A Method of Quantity Testing for Hardness

The atmosphere of steel balls was invented and investigated as a means of superhardening. The investigation has revealed another effect of equal importance. The initial ball velocity is so adjusted to the hardness of the work that it is just insufficient to indent the surface. It follows that if any part of the work is soft, its surface will be indented and roughened.

If, for example, a quantity of hardened steel articles are placed in a ball atmosphere of correct pressure, it will be found on removing them that any soft articles or any soft spots can be easily distinguished by their indented appearance.

We have here a new process, which may be called "cloudburst hardness testing," whereby large quantities of hardened articles can be tested for hardness, all at once, and all over, and without marking them, except on the soft spots. The existing cloudburst testing machine makes 200,000 hardness tests per minute. But this is only a small machine, and the number of tests can be increased indefinitely.

Where quantities are sufficient to warrant it, the work can be carried through the testing chamber on a conveyor, and when it emerges the soft pieces can be picked out like rotten cherries from a tray of ripe fruit.

As an instance of the way soft spots may be revealed (as well as the unharmed surface remaining after cloudburst superhardening) a photograph is reproduced of a piece of mild steel, case hardened, polished and superhardened. The letter H had been painted without protective compound before carburizing and was decidedly softer than the surrounding surface. The cloudburst roughened the softer surface and rendered it easily visible. The reflection of the steel screw shows the mirrorlike superhardened surface.

Reducing Tube Mill for Seamless Steel Tubing

A new reducing mill for the manufacture of seamless steel tubing, which has several unique features, has been brought out by the Wellman-Seaver-Morgan Co., Cleveland. In following established methods in the manufacture of tubing it is said to be rather difficult and expensive to make the smaller sizes, i.e., sizes smaller than 2½ in. outside diameter. In the ordinary methods of manufacturing this tubing it is the common practice to pierce and roll the blanks at approximately 3 in. outside diameter, and then to reduce the diameter in a continuous duo roll mill. In this mill each successive roll stand has its axis at 90 deg. to the preceding stand, to eliminate the rib formed at the meeting of the rolls, and also to reverse the pressure on the tube.

The newly designed mill has three rolls in the same plane in each housing. Each roll incloses 120 deg. of the circumference of the tube. The gears are mounted on roller bearings which, together with the gearing, are completely inclosed and run in oil.

The roll stands are all practically alike except that the roll assembly is shifted 180 deg. in each succeeding stand. The drive shaft always comes out in a horizontal line on the same side of the mill, and these shafts are driven through speed reducers by variable-speed motors, each stand having its individual motor. This, it is stated, permits exact regulation of speed and the handling of various gages and materials at the correct speeds. It is claimed that higher reductions per pass and higher quality of product are obtained, and that the maintenance cost is reduced. Application has been made for patents covering various features of the mill.

The Wellman company recently has been broadening its line of tube-making machinery. It has designed machinery for the production of hot-rolled seamless tubes up to 16 in. in diameter and as small as 1 in. in diameter, both by the Pilger method and the American or automatic rolling method. It is stated that the latest and most modern practice of both European and American mills has been embodied in these machines.

The first regional meeting of manufacturers and distributers of power transmission equipment, supplies and accessories will be held at 6.30 p. m., Feb. 3, at the Poor Richard Club, 1319 Locust Street, Philadelphia.

Low-Cost Pig Iron Means Highest Output per Furnace

From Larger Hearths, Better Selected Raw Material, and with More Efficient Utilization of Existing Auxiliaries and By-Products

BY W. A. HAVEN*

BLAST FURNACE men during 1927 as for several years past have concentrated on the difficult problem of keeping down costs during a period of reduced output. All items of equipment have been studied in an effort to replace labor with machinery, to eliminate delays and prevent accidents. Electrically operated devices for automatically gaging the furnace, dumping the bells and controlling the blast temperature have made their appearance. Stopping the tap hole at ten pounds blast pressure is being done regularly with steam guns of multiple cylinders. The indestructible tuyere has not yet been found, but the ultimate of continuous operation, 24 hours daily without reducing blast pressure, seems not far ahead.

Old Stacks Reconstructed with Larger Hearths

Economies have resulted from improving the quality of the raw materials, especially coke, from profitable disposition of the gas and slag by-products, and particularly from an increase in the size of the old stacks. Making more pig iron per furnace has always been a favorite procedure with American furnacemen, but harder blowing must now be strictly consistent with economy in ore and fuel. Much larger furnaces have resulted.

Recent enlargement has been chiefly by increasing the hearth diameter and straightening up the bosh. The name "large hearth" has always followed the furnaces with the largest size hearth, but the term has now come to signify furnaces having not less than 20 ft. hearth diameter. Furnaces of this size were built at South Chicago about ten years ago but their peculiar fitness for the economic production of large tonnages was not fully appreciated at that time. In 1925 and 1926 a number of furnaces were blown in having hearth diameters of from 20 ft. to 21 ft. 6 in.

In 1927 the large hearth furnaces established entirely new standards for productive capacity. Under the same conditions which got 500 tons per day from a 16-ft. furnace, or 600 tons from an 18-ft. furnace, the 21-ft. 6-in. furnaces have consistently made more than 750 tons per day; doing so with equally good furnace practice. A tendency to higher dust losses may be accounted for by the failure of stack and top dimensions to keep pace. Large hearth furnaces take a high blast temperature without difficulty and their coke rates have been as good if not better than smaller units. Blast pressures have been higher in some, but in others just as low as on the smaller furnaces. Tendencies to hang and slip have been if anything somewhat less, operating conditions generally less troublesome, and working conditions around the bosh improved.

Largest Hearth Now 24 Ft. 6 In.

Furnacemen were and still are somewhat amazed by the announcement that one company had blown in a furnace during 1927 having a hearth diameter of 24 ft. 6 in. This was done by a typical though extreme case of fitting a very large hearth to a moderate sized stack. The columns were moved out, and big jackets and mantel installed. One or more rings of new and heavier platework, sloping outward at the bottom, connect up the old shell to its new support. The top of the shell and superstructure are oftentimes undisturbed in such reconstructions.

The old and satisfactory relationship between hearth and top diameter cannot be preserved when rebuilding in this manner. One fundamental condition for proper stock distribution of fine northern ores must be preserved, namely: 2-ft. clearance between bell and furnace wall. With the large furnace in question the limitation seems to have been a 12-ft. 6-in. bell, which resulted in a top diameter of only 17 ft. A very disproportionate stack volume results, but nevertheless some record tonnages have been obtained.

With a fair quality of raw materials, a 24-ft. 6-in. furnace should easily do 850 tons per day. Since it is ordinarily feasible to increase the "normal" tonnage of any stack at least 20 per cent by physical and chemical betterment of ore and coke, it is safe to predict that this will be the forerunner if not itself the first American furnace to produce 1000 tons daily. It is no great step from a reconstructed unit of large hearth to one having other dimensions in the successful proportions found in smaller stacks. The lines of such a furnace might be somewhat as shown on the sketch.

Sintered Ore Will Increase Tonnage

It appears, however, that the distinction of operating the first 1000-ton furnace will not be for American furnacemen. The Germans are said to have furnaces making even more. It is of particular interest that it has been accomplished not by making the furnaces larger, although this is also being done, but chiefly by improving the quality of the raw materials, particularly ore. In certain cases a large portion of the ore mixture is sintered. In this way fines are almost eliminated, and a raw material exceptionally high in iron (about 68 per cent) is obtained. Large American furnaces, if supplied with rich sintered ores, would produce far more than anything yet achieved here or abroad.

Growing appreciation of these benefits may be considered a feature of the past year. Burdening northern New York furnaces with 100 per cent sintered magnetite has been accompanied with such economies in fuel and increased output, as to justify that district in the unusual procedure of sintering all the ore. These ores in their natural occurrence are extremely hard to reduce, even after crushing to a very objectionable degree of fineness, yet sintering makes a material so satisfactory for blast furnace use that sintered magnetite of a certain grade is now marketable as far west as Ohio.

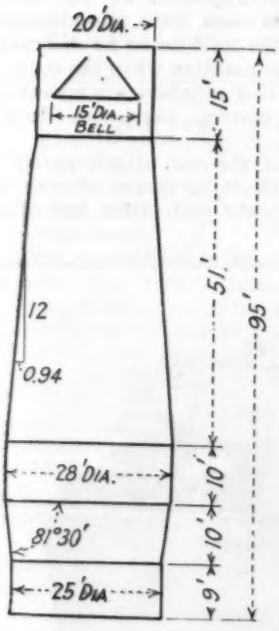
Progress with Flue Dust Problem

In 1927 several plants have been added to the list of those equipped for sintering flue dust. It is gratifying that the many problems in handling this obnoxious

*Superintendent of Northern Furnaces, Republic Iron & Steel Co., Youngstown, Ohio.

material are steadily being solved. Its extreme dryness and fineness has been at the start of this trouble; an excellent procedure is watering the material in a dust-tight conveyor-mixer as it passes from dust catcher to car. By this means, dumping the dust catcher is practically dustless and in subsequent handling the dust is but little more troublesome than fine ore. Proper cooling and moistening before reaching the sintering plant helps in the final hydrating before the dust reaches the sintering pan.

Excessive amounts of carbon in the dust is another drawback. Good results have recently been obtained with as little as 4½ per cent, whereas something more than 6 per cent was formerly considered essential. As high carbon dust is generally due to dirty or soft coke, the betterment of blast furnace fuel will also help solve the peculiar problems of flue dust.



At Left is a Sketch Showing Proposed Lines for a Blast Furnace to Have an Average Capacity of 1000 Tons per Day

The View at the Right Shows an American Blast Furnace After Remodeling from 16 ft. Hearth Diameter to 21 ft. 6 in. By this means capacity was increased from 500 to 750 tons per day

Improved Stove and Burner Performances

Large hearth furnaces have influenced the design and construction of such equipment as stock houses, stoves, blowing engines, cast house devices, ladles and gas burners. More than one plant has found the auxiliary equipment inadequate for the increased demands of stacks rebuilt to produce fifty per cent greater tonnage.

In stove design the problem has been to heat from 50,000 to 70,000 cu. ft. per min. of wind to 1300 deg. Fahr. or higher. Nothing less than 300,000 sq. ft. of heating surface will suffice, which means at least four stoves unless very small checkers are used. As the tendency, without justification perhaps, is away from the 3½-in. checkers to a medium size of 4 or 5 in., a return to four stoves is the usual procedure.

Pressure burners have helped meet the increased load upon the blast heating equipment. Two or three times the amount of gas formerly used may now be passed through each stove. By this means three stoves meet the requirements of some very large furnaces; other plants have secured much higher blast temperatures than with burners of the old aspirating type. But overloading the stoves to the point of increasing stack temperatures is not economical, so ample checker work is no less desirable than before.

Continued efforts are being made to provide cleaner gas for heating stoves and boilers, to recover waste heat and to increase gas burning efficiency. A marked advance has been a successful apparatus to transfer heat from the stack gases into the cold wet gas from the washers. By this means heat lost in washing is partly replaced and the sludge nuisance is eliminated, as entrained moisture is converted into water vapor. Several installations of this type are in operation.

Boiler house equipment had had some of the attention it has so long deserved. Most boilers fired with furnace gas today have less than 60 per cent efficiency, and a maximum of about 115 per cent rated capacity, whereas with modern improvements these units may be driven to more than 150 per cent of rating and their efficiency brought above 70 per cent. In this way increased gas from big furnaces may be utilized without installing additional boilers.

It is a matter of regret that a by-product of such proved utility as slag should fail to net a profit to the industry, but at least the cost of slag disposal is being substantially reduced. Nearly all plants are now equipped to prepare slag for some commercial purpose, usually in the hard form for road building, concrete construction or railroad ballast. Efforts are being made to produce slag of a grade that will be a preferred material in these lines of work.

Total Practical Capacity Highest in History

In blast furnace construction the policy of conservatism has been observed. Several old plants have been scrapped and few new ones built. Such has been the success, however, of the larger furnaces, better raw materials and improved types of auxiliary equipment, that the country's potential capacity for producing pig iron remains greater than ever before.

New Automatic Chucking Machine

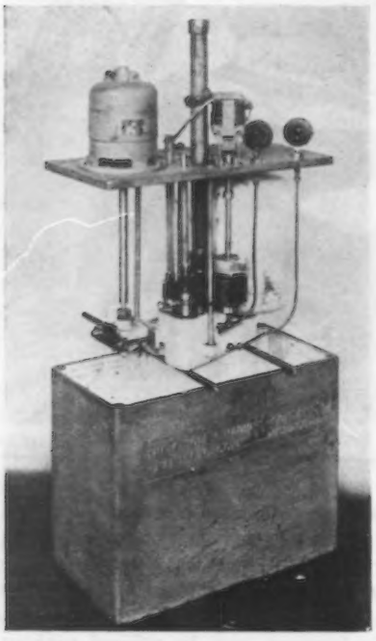
Feed of Tools is by Means of Two Tool-Carrying Bars Having Longitudinal and Semi-Rotative Movement —Hydraulic Chucking Employed

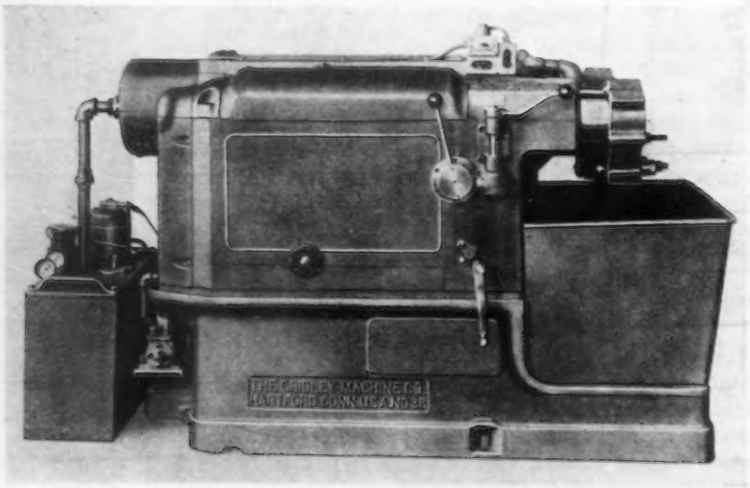
SIMPLICITY of tool set-up is a feature of a new chucking machine which has been brought out by the Gridley Machine Co., Hartford, Conn. The machine is of single-spindle work-revolving type and is designed for boring, turning, facing and forming operations on forgings such as the races of anti-friction bearings, etc. The swing is for chucks up to 10 in. in diameter and work up to 8 in. in diameter.

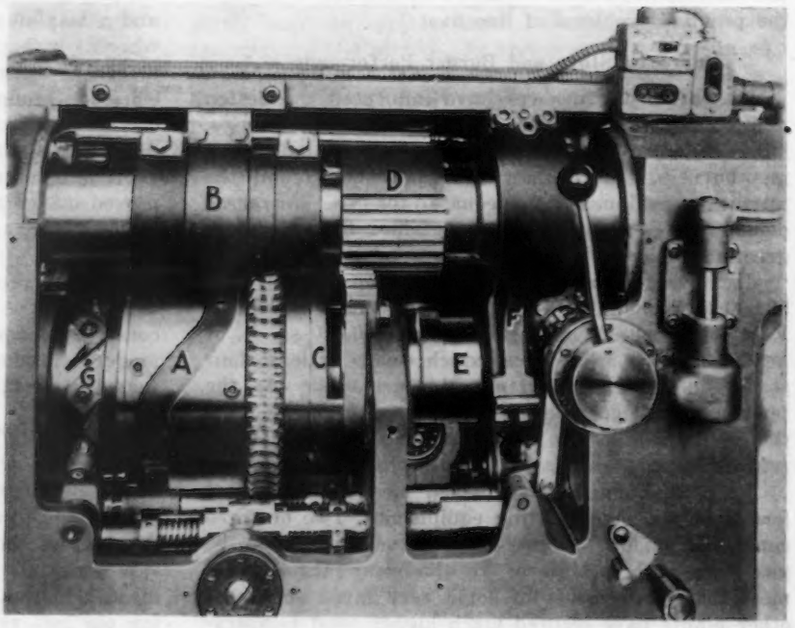
The general arrangement of the machine may be noted from the several views reproduced herewith. In this design two tool-carrying arms are mounted on the ends of tool slides or sliding bars of large diameter, one bar on each side and parallel with the work-holding spindle and chuck. No other moving parts are exposed during machining operations, the other mechanisms being inclosed within the cabinet of the machine. At the left-hand end of the machine is the hydraulic unit that actuates the work-holding chuck, and at the right-hand end, beneath the tool-carrying arms, is the chip box. The latter rests on rollers located in the front extension of the base, which rollers facilitate pulling of the chip box on to the platform of a truck, when the box is to be emptied. Observable also from the illustration of the operating-side of the machine is the central grouping of all controls.

The sliding bars or tool-operating slides are carried in split adjustable bearings at the front and the rear of the cabinet. They have independent semi-rotative and longitudinal movement, and each slide is independent of the other, being actuated by cams mounted on separate camshafts. The arrangement of the tool-operating mechanism may be seen from the close-up view herewith, which shows the mechanism as observed from the operating side of the machine when the covers have been removed. All rotating members are mounted on ball bearings and all moving parts are flood-lubricated.

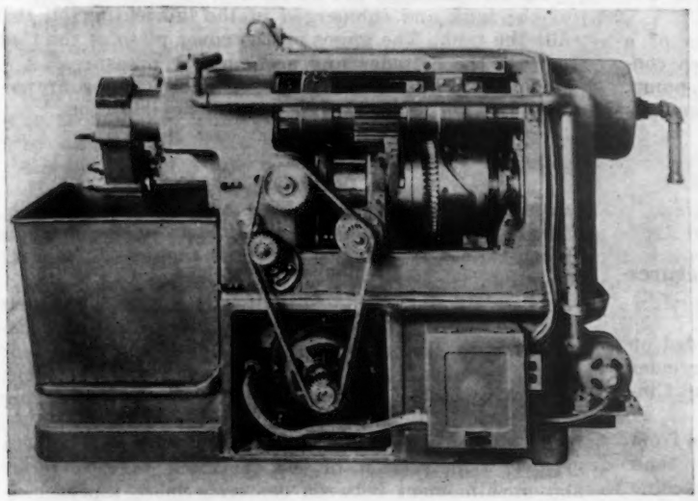
Longitudinal movement of the tool slides, parallel to the center line of the work, is by means of cam *A* and part *B*, which surrounds the tool slides, but does

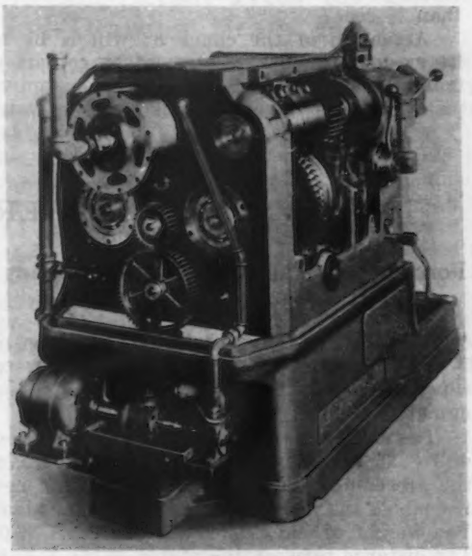






THE Operating Side of the Chucking Machine, With Covers in Place, Is Shown at the Upper Right. The close-up view shows the arrangement of cams, etc., on the operating side of the machine. The components of the hydrau chucking unit may b noted from the open view above





The Driving Side, With Covers Removed, Is Shown Above, and the Rear End of Machine, With Feed Change Gears, at Right

not grip it. This has lengthwise movement along a fixed guide and is confined between two collars. By this arrangement longitudinal movement may be transmitted to the bar without restriction of the semi-rotative movement.

The semi-rotative movements of the tool slide and tool-carrying arms attached to them, by which the cutting tools are swung to and from the work, are produced by the segment gear and pinion *D* (actuated by cam *C*) and cam *E*.

The cutting tools are positioned before they start to cut by means of the segmental pinion, the gear sector and the face cam. The wide-faced pinion *D*, with teeth cut on part of its periphery, is keyed to the tool slide and is in constant mesh with the gear sector below it. This gear sector derives a periodic swinging movement from the face cam *C*.

Cam *E* imparts semi-rotative movement to the tool slide during the cutting operation, except in the case of straight turning. It is splined to the camshaft and is mounted on the end of the shaft so that the cam may be conveniently removed and replaced by others of different shape. While the tools are cutting the hardened steel bearing piece of the lower end of the arm of part *F* rests upon the periphery of cam *E*. This part, *F*, is attached to the tool slide and moves with it.

Movement of the tools on the opposite tool slide is controlled by the camshaft on the other or driving side of the machine. It is the same as that shown in the close-up view except in the shape of the cams. The cam corresponding to cam *G* serves to stop and start the work spindle and to control the supply of coolant.

The drive arrangement may be noted from the accompanying view of the driving side with covers removed. From the motor in the base, the drive is by silent chain to the upper sprocket which is on the end of the wormshaft. The latter drives the work spindle, and through the spindle and change gears, drives the camshafts when the latter are in slow motion. Upper sprockets of different diameters provide for changes of spindle speeds, compensation for variations in length of driving chain being made by adjusting the sprocket at the left. Fast motion of the camshafts is obtained by the small sprocket at the right and clutches that are actuated by cam *G*. The latter serves to change the motion from fast to slow and vice versa, as required. The ratio of the change gears, a set of which is regularly furnished, determines the rate of the slow rotation of the camshafts, which is equivalent to the rate of feed of the cutting tools. The fast motion of the camshaft returns and repositions the tools.

Before the start of the cycle of operations the positions of the cams and other parts are as shown in the close-up illustration. When the starting lever of the machine is moved, cam *C* actuates the gear sector, which rotates the bar and moves the arm *F* so that the bearing piece of the latter is in line with the periphery of cam *E*. This movement swings the tool-carrying arm and brings the cutting tool toward the work.

The whole slide is then moved toward the left by cam *A*, which advances the tool to the cutting position. The gear sector is released by cam *C*, and the bearing piece of arm *F* is allowed to rest on the periphery of cam *E* for the remainder of the cycle. The motion of the camshaft is then changed from fast to slow by means of cam *G*.

For parallel boring or turning, a cylinder is used for cam *E*, which produces no further tangential advance of the cutting tool during its traverse to the left. If the cut is taper, cam *E* will have a constant rise, and if it is to be irregular the cam will be made accordingly. If the cut is entirely one of forming, the slide will be advanced to its extreme left position by cam *A*, and held stationary while the tool is advanced tangentially to the work by the rise of cam *E*.

Coolant is pumped to the tools and lubricating oil forced to the horizontal pipe on top of the cabinet by means of two pumps which are mounted on the rotor shaft of the motor located at the end of the base of the machine. The horizontal pipe for lubricating oil is perforated and serves to spray oil continuously over the mechanism within the cabinet. The reservoir for the coolant surrounds the motor and extends into the base under the chip box. The lubricating oil reservoir is also inclosed in the cabinet.

The floor space occupied by the machine is 33 x 78 in., and the weight is approximately 6800 lb.

Hydraulic Chucking Employed

The hydraulic unit for actuating the work-holding chuck is of the company's design. It is designated as the model HU 200, and has been placed on the market recently for use on screw machines, automatic lathes and other equipment on which air-operated chucks or fixtures have been employed. The unit is self-contained and is designed to stand on the floor and connect with the machine by a single pipe, which conveys the oil. A motor lead to the source of power and the mounting of a switch at the operating position completes the installation of these units. By means of the switch the operator may open or close the chuck or fixture in a fraction of a second and can vary the constant pressure maintained to suit the holding power required for the particular work.

The unit, an open view of which is shown in a separate illustration, includes a small rotary pump which is directly driven by a ¼-hp. motor and serves to maintain constant pressure on the chuck cylinder. This pressure may be adjusted quickly up to 150 lb. per sq. in. While the work is being held in the chuck, the pump, by means of a piston by-pass valve, builds up in an accumulator, the energy to actuate the cylinder piston at high-speed when new work is placed in the

chuck. The time of opening or closing the chuck is less than ½ sec.

Actuation of the chuck at will is by means of a heavy-duty tumbler or momentary contact switch controlling a solenoid piston valve. The piston valve, pump, piston by-pass valve, accumulator relief valve, accumulator and manifold are suspended from the cover plate of the tank and submerged in the lubricating oil that fills the tank. The gages on the cover plate of the tank indicate the cylinder and accumulator pressures. Any leaks that might occur in the cylinder packing are returned to the unit through a small flexible tube.

NEW ROLL GRINDER

Forced Feed Table Lubrication Among Features of 24-In. Swing Machine

FORCED feed table lubrication has been provided on the 24-in. swing self-contained plain roll grinder illustrated, which has been added to the line of Cincinnati Grinders, Inc., Cincinnati.

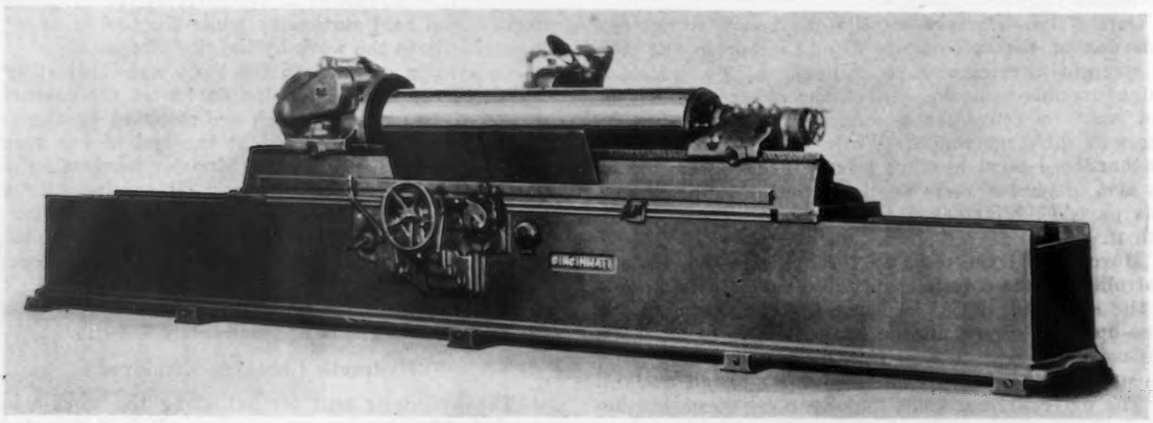
The machine is available in 13 different lengths from 48 to 336 in., each larger size being 24 in. longer than the preceding. In method of control, the new machine resembles the company's 12- and 16-in. plain grinders. The weight of the grinder illustrated is 30,000 lb. net. The distance between the center of the V-guide and the center of the flat bearing of the table is 20½ in.

The system of oiling the table guides is unusual. Instead of oil-distributing pockets with rollers in the bed, the V and flat table ways are flooded with filtered oil from a pump which is geared directly to the drive shaft. The oil is pumped from a central tank to the table guides at about 4 lb. pressure and distributed through oil grooves cut on the under side of the sliding table. These grooves extend the length of each table bearing and are open at the ends. In this way the oil pressure is constant throughout the length of the table, and regardless of how short the traverse the ways are always flooded with clean oil. In draining back to the central tank, the oil passes through a settling chamber on each end of the bed, and a Purolator which removes the grit and dirt. This system of table lubrication is incorporated under lease from the Gray Planer Co., Cincinnati. Lubrication of other parts of the machine is centralized at a few points, and requires infrequent attention.

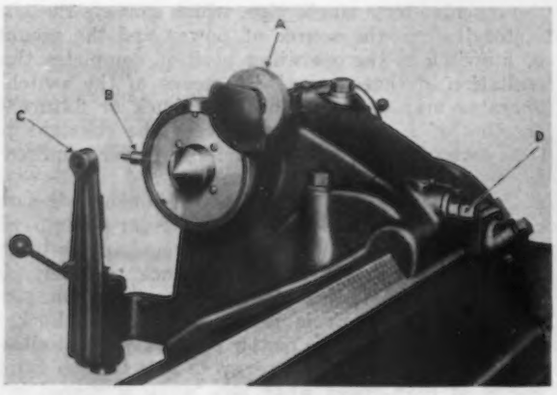
Standard machines are built with single tables, but machines up to 144 in. between centers have been designed with two tables, one an upper work table or swivel table and the other, the lower, a sliding table. The swivel table is designed with the large bearing areas to provide maximum stability, and tapers 12 ft. in length may be ground. On single-table machines a set-over construction in the footstock takes care of any misalinement between centers. Short tapers may be ground if the cutting face of the grinding wheel is dressed to the desired degree and then brought straight into the work. The table is traversed by means of steel gearing with a safety friction clutch, which comes into operation if the machine is jammed. This clutch also functions at each reversal of the table.

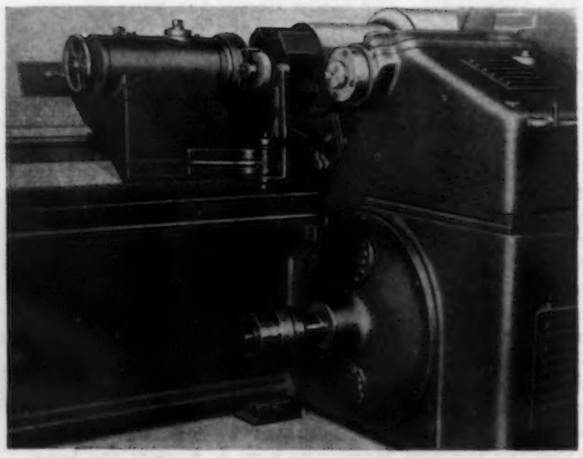
The wheel head is of heavy design, and is mounted on large V and flat bearings. A 30-hp. motor mounted on the outside of the machine is coupled to the main drive shaft by a flexible coupling. The spindle is driven from the main shaft with a multiple-strand Texrope drive which runs over idlers in order to permit of adjusting the wheel slide. Inspection of the moving parts of the drive is facilitated by openings in both the wheel head and bed.

The weight of the wheel head plus the downward pull of the Texropes is said to hold the slide on the ways even under the heaviest cuts. The wheel slide guide is a generously proportioned V bearing and the infeed



Roll Grinder With Cast Iron Sleeve in Grinding Position. On the footstock, below, A is the wheel truing fixture; B the diamond holder; C the radius truing fixture; and D the set-over screw. The flexible motor coupling is shown at lower right





screw is mounted directly on the center of the V. The wheel head is balanced with a large counterweight to assure smooth infeeding and accurate sizing.

The grinding wheel spindle is mounted in half bearings of bronze, the upper halves acting as safety caps on the spindle. The spindle is lubricated automatically by oil which is lifted out of a reservoir in the wheel slide and carried into distributing pockets in the spindle cap by means of centrifugal slingers on the spindle. The spindle is made from a chrome-nickel steel forging, heat treated, and ground to a high finish; it is designed to carry a wheel 12 in. wide if necessary. End thrust is taken up by a double-thrust ball bearing which may be adjusted while the spindle is running. It is claimed that this type of spindle mounting is free from chatter.

Table traverse speeds, 12 in number, are obtained through hardened steel sliding gears mounted on hardened shafts with integral multiple splines. The gear box is mounted on the back of the bed of the machine, and speeds are controlled by a single lever from the left front of the machine.

The grouping of all controls within easy reach of the operator, making it unnecessary for him to move from a central position, is a feature emphasized. A mirror attachment is provided to enable the operator to see the point of contact between the wheel and the work without bending over the machine. The headstock is controlled by a rheostat, located on the right front of the machine, which in turn operates through a dynamic braking panel.

Power is transmitted to the faceplate through Texrope drive, worm and large worm wheel. A 3-hp. 230-volt d.c. motor is employed and the speed of the faceplate ranges from 11 to 96 r.p.m. The work headstock is of dead center type and is held in place on the table by three clamping bolts, while the footstock has two. Where direct current is not available, a 3½-kw. 230-volt d.c. generator with rheostat is built into the machine.

In addition to the set-over screw construction provided to facilitate parallel grinding on the single table machines, the footstock is said to be unique in that it is equipped with two types of wheel truing devices. A roll type truing fixture can be mounted on the large diameter behind the work center, or a diamond can be used as wanted. The radius truing fixture bolted to the footstock shown in the close-up illustration of the footstock rounds the edge of the grinding wheel for grinding fillets on rolls. Both head and footstock are adjustable on the table by hand-operated rack and pinion. The tailstock spindle, operated by a handwheel, has a full length adjustable bearing to compensate for wear.

A power driven center grinder, driven from the headstock, for regrinding work centers is standard equipment. The coolant pump is of centrifugal type and is arranged so that its bearings do not come in contact with the water. The coolant nozzle is carried on the front of the wheel guard. Adequate water guards and wedge blocks for alining the grinder on its foundation are regularly furnished.

Steels for Ammonia Synthesis

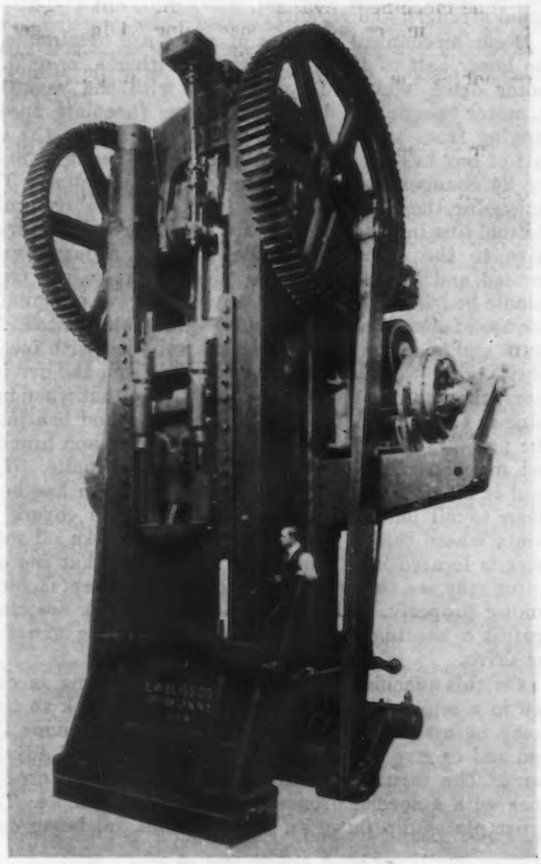
Technologic Paper No. 361 of the Bureau of Standards covers in considerable detail the material presented to THE IRON AGE readers Dec. 1, 1927, page 1518. J. G. Thompson, the author of the article noted, together with J. S. Vanick and W. W. Sveshnikoff, wrote the Bureau's publication, entitled "Deterioration of Steels in the Synthesis of Ammonia."

The Struthers-Wells Co., Warren, Pa., is now manufacturing standardized types of heat exchangers for oil refineries, chemical and process work, power, by-product and coke plants, etc. These standard heat exchangers are claimed to have high fluid and vapor velocity, well developed turbulence, removal tube bundle, a high practical heat transfer rate and full allowance for expansion and contraction. A new bulletin describing these is available on request.

Large Double-Action Press for Cutting and Drawing Heavy Metal

A special single-crank double-action power press, which, weighing approximately 400,000 lb., is the largest machine of this type ever built by the E. W. Bliss Co., Brooklyn, N. Y., is shown in the accompanying illustration. The diameter of the crankshaft is 18 in. at the bearings and 21 in. at the pins. The machine is designed to draw and lift out work up to a depth of 11 in., and is adapted for the cutting and drawing of heavy metal. It has a capacity of 1000 tons, divided as follows: 500 tons on the blank-holder and 500 tons on the plunger.

The press is of tie rod construction, the entire working strain being taken by the four large steel tie rods which tie the crown, bed and uprights together. The arrangement is such that if desired the inner and outer



The Crankshaft Is 18 *In. in Diameter at the Bearings and* 21 *In. at the Pins. The machine will draw and lift out work to a depth of* 11 *in.*

slides can be locked together and the press used as a single-action press for work requiring a pressure of 1000 tons. This change is made by driving two pins through the blankholder and plunger slides and removing two keys in the connecting rods, actuating the blankholder slide, which rods are made in two pieces for this purpose.

When used as a double-action press the blankholder is operated by long links inside the housing which are connected to a crankshaft in the bed. The crankshaft is operated by the main gears through a toggle motion, has four crank pins, two of which are used to operate the blankholder and two to operate the positive liftout in the bed. Adjustment of the blankholder is by four large adjusting screws and plunger adjustment is made by a 15-hp. motor mounted on the crown. The machine is driven by a 125-hp. motor and it is triple geared and has twin drive.

Dimensions are as follows: Distance between housings, 60 in.; distance from the bed to blankholder, stroke down, adjustment up, 42 in.; and distance from the bed to the plunger, 48 in. The stroke and adjustment of the blankholder, respectively, is 11⅜ in. and 8 in.; of the plunger, 24 in. and 8 in.; and of the knockout, 11⅜ in. and 7 in.

42-In. Heavy Engine Lathe Has Improved Headstock and Carriage

The Niles Tool Works Co. division of the Niles-Bement-Pond Co., Hamilton, Ohio, is adding to its line a 42-in, heavy engine lathe having improved features, particularly in the headstock and carriage. The actual swing of the machine is 43 in. and the length of bed is 32 ft. The drive is by a 20-hp. variable speed motor, but may be increased to 25 hp. or more, according to the service required.

Main spindle bearing dimensions have been increased about 40 per cent and other parts correspondingly. All gears in head are now of steel. The forged faceplate gear ring, also of steel, is of the same diameter as the outside of the faceplate and is shouldered and bolted to the faceplate. The faceplate is forced on the spindle by a hydraulic press and fits against the large flange on the spindle to which it is also bolted to give additional strength and rigidity.

Four mechanical changes of speed are obtainable in the lower half of the headstock for either a. c. or d. c. motor drive, which in conjunction with the variation in motor speeds for d. c. drive, gives faceplate speeds ranging from 1.9 to 231 r.p.m. For a. c. drive the top half of box has six additional mechanical changes, making 24 changes, ranging from 1.5 to 169.5 r.p.m. The pinion for the faceplate drive is located directly under the tool line in order to assure a smoother drive. Direct drive to the spindle is made through a large gear pressed and keyed on to the spindle next to the front spindle bearing. This is the only drive gear on spindle. The use of sleeves on the spindle has been eliminated. All gears and bearings in the head are supplied with forced lubrication by a pump which is driven from the driving gears, the pump being direct connected so that when machine is started oil is forced to the gears and bearings. The pump is bolted to a combination cover and bracket and may be removed by taking out four bolts. The head is oil tight and dust proof and attention has been given to oil leakage by placing drains and covers at points where this is most likely to occur. An oil indicator is located in a prominent position so that the operator may see that the headstock oiling system is functioning properly. All gears in the headstock are close against a bearing and there are no overhung gears in the drive.

On this machine the spindle thrust bearing is carried in a separate unit outside of the headstock so that it can be made of adequate proportions to assume the load and to give ready access for inspection and adjustment. The thrust is taken on a hardened and ground block with a special bronze washer on the spindle. The thrust plates dip in an oil compartment, oil being carried by slingers over the surface of the bearing. Adjustment is made by spanner wrench on two nuts on the ends of the bolts carrying the thrust bracket.

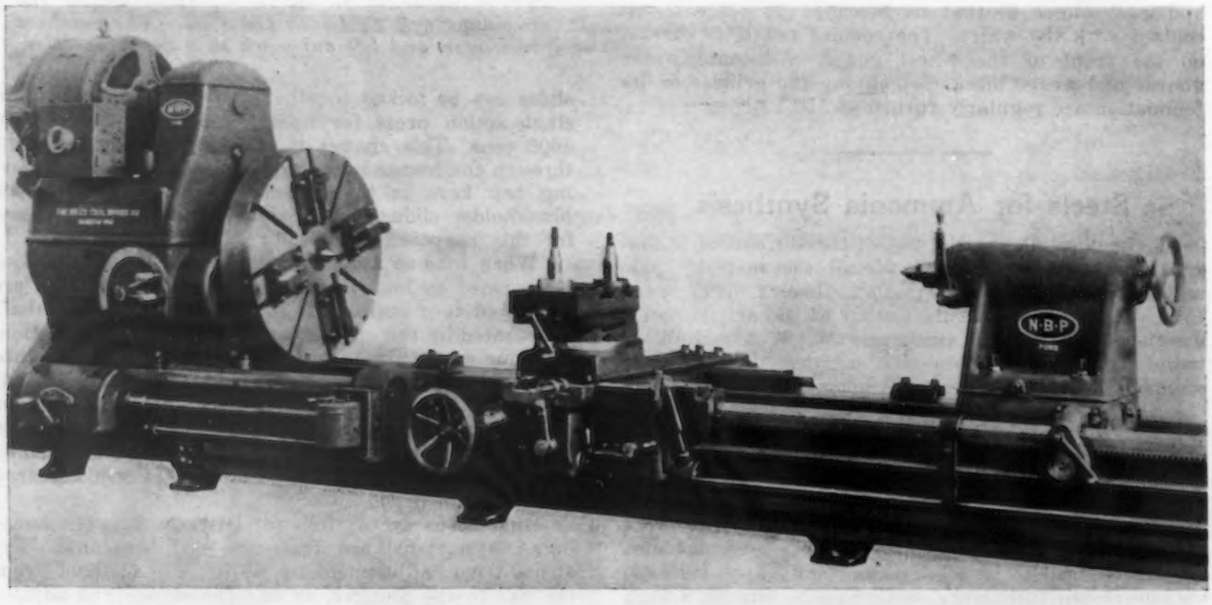
With the d. c. drive the faceplate is stopped quickly by dynamic braking. In the a. c. drive a mechanical brake incorporated in the gear box is operated from a motor control lever on carriage. Moving the lever to the "off" position automatically applies the brake. A jog button is provided on the headstock for slightly turning over the gears while shifting and for inching the faceplate in setting up or inspecting work.

The motor pinion shaft is supported between two bearings independent of the armature shaft bearings so that the motor bearings are not subject to load from the gears.

The carriage apron is of new design. The carriage is supported on the bed on V tracks, but the bridge also has a flat bearing on the inner edge of front shear, giving a solid bearing directly under the tool. The carriage is gibbed underneath the track at the front and the back and can be securely clamped in position when cross feeding. A graduated swiveling tool slide with four clamping bolts and tool straps is regularly furnished instead of the two poppet tool holders shown. Provision is made for power angular feed, which may be supplied as an additional feature, and power rapid traverse to carriage is also optional. A separate reversing motor used for the latter is mounted on a bracket on the carriage and connected by gearing with feed rack. The rack pinion may be withdrawn when cutting threads.

The apron is a one-piece casting assembled as a self-contained unit. An oil reservoir is provided in the top, the oil being led to all gears and bearings through brass piping. This reservoir is filled through holes in top of carriage. Feeds are engaged and reversed by sliding gears and positive tooth clutches. The lead screw is splined the full length and drives a double fine tooth clutch which engages either one of two bevel gears. The clutch is moved by lever at the front of the apron. This provides means of changing the direction of the feed or for stopping the feed by throwing it into neutral.

A lever for securing either cross or longitudinal feed is located at the side of apron. This lever controls a sliding gear which in one position is in engagement with the cross feed gear and when thrown in the other direction connects with the gear train to the rack for longitudinal feed. The lever for engaging the lead-screw nut is interlocked with the feed. All gears in apron are of steel and are doubly supported on large shafts. The rack pinion also has a bearing at its outer end. The feed gear box provides four changes of feed and threads by sliding gears and clutches. Change gears for additional feeds and threads are furnished.



The Actual Swing of the Lathe Is 43 In. The main spindle bearing dimensions have been markedly increased and all gears in the head are now of steel. The carriage apron is of new design

Price Cutting Threatens Prosperity

Half of American Industry Operating at a Loss—Stabilizing of Bolt and Nut Market Indicates What Can Be Done in Other Lines

BY CHARLES J. GRAHAM*

PROFITLESS prosperity had its innings in 1925 and 1926 and reached its climax in 1927 and, in so doing, brought forcibly to our attention the threat contained in its continuance by the abnormal number of business failures during that period.

The failures in dollars reached the stupendous figure of two billion in 1925, two billion two hundred million in 1926 and up to the end of August, 1927, one billion seven hundred and forty-five million. If the same average continued over the last four months of 1927, the figures for the year would show the staggering total of two billion seven hundred and sixteen million dollars.

In 1926, 41 per cent of all corporations doing business in the United States did business at a loss. In 1927, when all the returns are in, this will probably grow to close to 50 per cent.

In 1926 there was 23c. lost for every dollar earned. In 1927 this figure will, in all probability, be very materially increased, and, if such a condition were permitted to continue, it would eventually have but one answer—complete demoralization, great national suffering and another long period of readjustment.

There is no argument against the economic unsoundness of one-half of our business institutions doing business at a loss, and it goes without saying that to correct such a condition is our greatest national problem. Its solution means the one great accomplishment we must all strive for if it is our desire to keep America in her present position as a world power.

The problem *must* be solved if we are to stabilize and perpetuate present labor conditions in the United States both from the standpoint of employment and the return to labor.

We all have come to a full realization of the fact that satisfactory labor conditions and present high wages are responsible for the degree of prosperity we have had, and any underlying condition which would affect in any way our ability to keep up the present rate of employment or of wages paid would have the effect of cutting down buying power, would restrict production, and the inevitable result would be a long period of depression, of suffering and of dissatisfaction.

We have now reached the turn of the road. The best brains of American business—political, social and economic—are now face to face with this problem and undoubtedly with such intensive study it will be solved, and every business man in America has his responsibility and his place in the eventual solution of it.

How Losses Were Turned to Profits in Bolt and Nut Industry

The bolt, nut and rivet industry, which I represent, had its baptism of fire in 1924, when its losses were running into such figures that practically the entire industry was facing complete annihilation. This caused the best brains in our industry to combine in an effort to bring about a "right about face" and study its individual problems as an industry, and it has accomplished rather remarkable results.

From an industry loss of 12 million dollars in 1924, we have, by consistent cooperative effort in every way possible, converted this loss into a profit of approximately six millions of dollars per year in 1925, 1926 and 1927; a change of 18 millions of dollars per annum on an invested capital of about 150 million dollars.

Six million dollars profit on such an investment is not sufficient, but it is a move in the right direction and, by further effort along constructive lines, we hope to bring about a condition whereby we will finally make a return consistent with manufacturing necessity and be able to make not only a fair return for our stockholders, but a return sufficient to enable us to keep abreast of the times in modernization of equipment.

This has been done under the handicap of a very large overproduction; 55 per cent of our equipment will supply the present normal requirements of bolts, nuts and rivets in the United States.

The same problem that we had in 1924 is now facing many other industries, and the same result we have attained can be accomplished by all if they put the same sincere constructive effort into it that we have done.

Selfishness Greatest Evil in Competitive Lines

We made a complete scientific study of the reasons behind such a condition. We found that the greatest underlying evil we were up against was the evil that is sapping the life out of practically all competitive lines of American industry today, and that evil is selfishness.

We found that we were conducting our individual companies on a basis that had lost all semblance of decency or fairness—fairness to ourselves, our competitors, our customers or to the world at large.

We have entirely revolutionized our business methods. We have dug in deep and brought to the surface all of the evils we could find and have killed them one by one. We have developed a degree of unselfishness never before attained either in our industry or any other we know anything about.

What has been the result other than a return in dollars? We can look the world in the face today with a degree of pride, our competitors are our friends rather than our enemies and we are conducting our business on a higher ethical plane than ever before and have created the same honest conduct in our business as heretofore ruled in our social lives.

We have gone further than this. We have started a movement which we feel has solved the distribution problem in our own industry and, if the same plan is followed by all other industries, it will be the greatest automatic stabilizer of business and labor conditions of anything heretofore attempted.

Organization of Agencies of Distribution a Boon

Our distribution plan is very simple but very effective. We have been brought to realize the importance of the jobber in the proper and economical distribution of our merchandise.

During the period of ruthless competition culminating in our financial distress in 1924 we had ignored the existence of the jobber and became his chief competitor, thereby creating in him an enemy and becoming the chief aggressor in the rapid decline of our markets brought about entirely by our lack of appreciation of his importance to us.

Beginning early last year and finishing only last week, a committee of eight of the leading executives of our industry toured the entire United States. We have held meetings with the jobbers in 36 cities, representing every important jobbing center, and have now converted the jobber from an enemy to a friend and have made him a supporter of our markets rather than

(*Concluded on page* 378)

*President Bolt, Nut and Rivet Manufacturers Association, Pittsburgh. Abstract of address before the Pennsylvania State Chamber of Commerce at Harrisburg, Pa., Jan. 25.

Youngstown-Inland Steel Merger

Combined Companies, with Ingot Capacity of 5,000,000 Tons Annually, Will Rank Third in Size in Country

THE long-discussed merger of Youngstown Sheet & Tube Co. and the Inland Steel Co. was concluded on Jan. 25 and there now remains only the working out of some minor details to complete a combination that will put under control of one management capacity capable of producing 5,000,000 tons of steel ingots annually and which has plants located in Youngstown and the Chicago district making a well-rounded line of finished products. The new company in size will rank next to the Steel Corporation and the Bethlehem Steel Co.

Directors of the Yougstown Sheet & Tube Co. and the Inland Steel Co. on Tuesday approved the merger. A special Sheet & Tube stockholders' meeting to ratify the action has been called for March 15. Inland Steel has decided to retire, effective April 1, its outstanding $10,000,000 of preferred stock, at $115 per share, making payment from its own assets. The charter under which Sheet & Tube operates as an Ohio corporation is to be amended in pursuance of the terms of merger, and the name changed to the Youngstown-Inland Steel Corporation.

The Youngstown company in Youngstown produces sheets, bars, pipe and wire products, while in its Chicago district plants it makes pipe and tin plate, having only last year started up a modern tin plate plant of 24 mills. The Inland Steel Co. capacity nicely complements the Youngstown line, with rails, structural shapes, both light and heavy, bars, rods, plates and sheets, besides capacity for spikes, bolts, nuts and rivets.

New Shares to Be Exchanged for Present Shares

The new corporation will issue 3,200,000 shares, of which 2,000,000 shares will be given to present holders of the common stock of the Youngstown company on a basis of two new shares for one old, and the other 1,200,000 shares will go to holders of Inland common stock on a basis of one new share for one old share.

"In order to adjust net assets to be contributed by the respective companies," the official announcement reads, "the Youngstown Sheet & Tube Co. will declare a dividend to the aggregate amount of $1,250,000 to be distributed to holders of its common stock and the Inland Steel Co. will declare a dividend of the aggregate amount of $6,000,000 to be distributed to holders of its common stock.

Youngstown Sheet & Tube Properties

The Youngstown Sheet & Tube Co. operates iron and steel making plants at Hubbard, East Youngstown, Struthers, Youngstown, Warren, and Zanesville, Ohio; East Chicago, Ind., and South Chicago and Evanston, Ill. The company owns under lease the Newport-Bonnie mines and the Palms-Anvil-Keweenaw group on the Gogebic Range in Michigan and the Isabella Mine on the Marquette Range in the same State. It also has partial ownership in a number of ore properties in Minnesota and Wisconsin operated by Pickands, Mather & Co., and owns and operates the Mayville mine on the Iron Ridge Range in Wisconsin.

Products Are Widely Diversified

Products of the Sheet & Tube Company include iron and zinc ores, lead and zinc concentrates, coal and limestone, coke and coke oven by-products, sulphuric acid, basic, Bessemer, malleable, foundry, forge, and high and low phosphorus pig iron, blooms, slabs, billets, sheet bars, muck bar, skelp, socket iron, merchant bars and angles, concrete reinforcing bars, agricultural implement shapes, spring steel bars and springs, black, galvanized, blue annealed, automobile, furniture, full-finished and special finished sheets, formed roofing and siding sheets, universal and sheared plates, wire rods, plain, galvanized and copper coated wire, woven-wire fence and concrete reinforcing fabric, galvanized, polished, blued and cement coated wire nails, wire staples, wire hoops, barbed wire and flexible steel armored electrical cable, black and galvanized steel pipe, oil well casing, tubing, drive and line pipe, boiler tubes, rigid steel conduit, conduit elbows, couplings and unions, and oil and water well tools and supplies.

Mills in Youngstown District

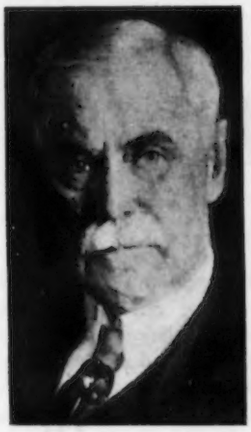
At the Hubbard, Ohio, works are two blast furnaces having an annual capacity of 325,000 tons of foundry, basic and malleable pig iron.

The Campbell works, East Youngstown, Ohio, has four blast furnaces with a capacity of 900,000 tons annually. The by-product coke plant consists of 306 Koppers ovens, by-product recovery plant and Semet-Solvay benzol plant, with an annual capacity of 1,500,000 net tons of coke and 4,000,000 gal. of light oil. The Bessemer department of the steel works contains two 12-ton Bessemer converters and five cupolas. In the open-hearth department are 12 100-ton basic open-hearth furnaces, 36 gas producers and three hot metal mixers. The plant has a capacity of 780,000 tons of Bessemer and 840,000 tons of basic open-hearth steel ingots.

In the rolling mill department are 24 double puddling furnaces, two busheling furnaces, two rotary squeezers, 16 four-hole soaking pits, nine slab heating furnaces, five continuous producing gas and coke oven gas fired heating furnaces equipped with 49 gas producers, one 40-in. and one 44-in. two-high, one-stand blooming mills, an 18-in., two-high, 10-stand continuous billet mill, an 18-in., two-high, eight-stand continuous sheet bar mill, a 10-in., two-high, 10-stand continuous skelp mill, a skelp mill with 20-in., three-high, one-stand roughing and 16-in., two-high, three-stand finishing, a skelp will with 18-in., three-high, two-stand and 18-in., two-high, one-stand, two 29-in., three-high, two-stand merchant bar mills, one 30-in. x 72-in. universal plate mill, one sheet and one pair furnace and 14 combination sheet and pair furnaces, 15 hot, black sheet mills, four cold mills, eight double-box annealing furnaces, four plunger pickling machines, six galvanizing pots, tube mill with six butt-weld furnaces, five lap-weld furnaces and four galvanizing pots. The plant has an annual capacity of 688,400 tons of hot rolled finished products including 600,000 tons of black pipe and 88,400 tons of black sheets, 800,000 tons of skelp and 50,000 tons of couplings.

At the Struthers, Ohio, works are three continuous heating furnaces; one 10-in. two-high, 16-stand wire rod mill, one 12-in., two-high, nine-stand bar mill, one 9-in., two-high, 12-stand bar mill, wire mill with 206 wire drawing blocks, 192 wire nail machines, nine straightening and cutting machines, 48 barbed wire machines, 17 wire fence machines, 13 wire hoop machines, three wire galvanizing pans and nail galvanizing equipment. In the conduit department are two electro-galvanizing units for lap-weld and butt-weld pipe. The plant has a capacity of 370,000 tons of hot rolled products, including 250,000 tons of merchant and concrete bars and 120,000 tons of wire rods.

The Brier Hill Works, Youngstown, acquired by the purchase of the Brier Hill Steel Co., March 1, 1923, has three blast furnaces, which have an annual capacity of 550,000 tons of basic pig iron. The by-product coke plant consists of 84 Koppers ovens, a by-product recovery plant and a Koppers benzol plant. The annual capacity is 370,000 net tons of coke and 1,000,000 gal. of light oil. The open-hearth department has 12 basic



JAMES A. CAMPBELL has been active in the steel business since 1891, when he became superintendent of the Warren mill of the former Trumbull Iron Co. Then followed various connections in an operating capacity until in 1901 he was made vice-president and general manager of the Youngstown Sheet & Tube Co. In 1903 he was elected president.

L. E. BLOCK has spent his entire business life in the coal and iron business. He was treasurer and director of the Inland Coal & Washing Co. from 1897 to 1905, becoming vice-president and treasurer of the Inland Steel Co. in the latter year and in 1919 he was elected chairman of the Inland board of directors.

P. D. BLOCK began his iron and steel experience with the Block-Pollak Iron Co., Chicago and Cincinnati, in 1888. In 1903 he became vice-president and treasurer of the Inland Steel Co. and in 1919 was elected its president.

open-hearth furnaces, with an annual capacity of 780,000 tons of steel ingots. In the rolling mill department are six continuous heating furnaces, three normalizing furnaces, eight four-hole soaking pits, one 40-in., two-high, one-stand blooming mill, one 24-in., two-high continuous mill, one 24-in., two-high, six-stand merchant mill, one 32 in. x 84 in. sheared plate mill with one stand two-high and one stand three-high, one 40 in. x 110 in. three-high, one-stand sheared plate mill, eight sheet and eight pair furnaces, eight hot black sheet mills, two trains of cold rolls of four stands each, 16 box annealing furnaces, and four pickling machines. The plant has a capacity of 700,000 tons of semi-finished products and 430,000 tons of finished products, including 370,000 tons of sheared and universal plates and 60,000 tons of black sheets.

At the Western Reserve Works, Warren, Ohio, acquired with the Brier Hill Steel Co., are two pair furnaces, five combination sheet and pair furnaces, two two-high jobbing mills with one roughing stand and one finishing stand each, five hot black sheet mills, eight stands of cold rolls, four box annealing furnaces, four blue annealing furnaces and one pickling machine. The plant has a capacity of 70,600 tons of black sheets.

Plants in Chicago District

The two blast furnaces at the Indiana Harbor works, East Chicago, Ind., which were acquired by the purchase of the Steel & Tube Co. of America in June, 1923, have an annual capacity of 468,000 tons. The coke plant consists of 120 Semet-Solvay coke ovens, a by-product recovery and a benzol plant, with an annual capacity of 648,000 net tons of coke and 2,880,000 gal. of light oil. The steel works has two 15-ton Bessemer converters, four 75-ton basic open-hearth furnaces, one 600-ton mixer and three cupolas. It has an annual capacity of 600,000 tons of Bessemer and 240,000 tons of basic open-hearth steel ingots. In the rolling mills are five slab reheating furnaces, one Morgan continuous heating furnace, six soaking pits, one 35-in., two-high, one-stand blooming mill, one 28-in., two-high, one-stand billet mill, one 10-in., two-high, 11-stand continuous skelp mill, one 30 in. x 88 in., two-high, one-stand sheared or universal plate mill, two butt-weld and three lap-weld furnaces, and one galvanizing pot. The plant has a capacity of 280,000 tons of slabs and 200,000 tons of billets and 370,000 tons of finished products, including 130,000 tons of plates and 240,000 tons of black pipe.

The four blast furnaces at the South Chicago Works, South Chicago, Ill., have an annual capacity of 810,000 tons.

The Evanston works, Evanston, Ill., consist of two butt-weld furnaces and one galvanizing pot. The plant has an annual capacity of 72,000 tons of black pipe. The Zanesville works, Zanesville, Ohio, consist of two lap-weld and two butt-weld furnaces and two galvanizing pots. It has an annual capacity of 120,000 tons of black pipe. Both of these plants were acquired with the Steel & Tube Co. of America.

Properties and Products of Inland Steel Co.

The Inland Steel group consists of the Indiana Harbor works, plants Nos. 1 and 2, Indiana Harbor, Ind.; a rail steel bar mill at Chicago Heights, Ill., and sheet mills at Milwaukee. The Indiana Harbor plant covers 600 acres and 800 acres of vacant property is held in Porter County, Indiana. These tracts are served by the New York Central, the Pennsylvania and the Baltimore & Ohio railroads. The company owns 8000 acres of coking coal land in Jefferson County, Illinois, and 2000 acres in Pennsylvania. Ore properties are owned and leased in the Mesabi and Cuyuna ranges of Minnesota. The company also owns an interest in the Inland Steamship Co., which operates three 10,000-ton ore boats.

The principal Inland products are basic, malleable and foundry pig iron, coke and by-products, steel ingots, slabs, blooms, billets and sheet bars, rails, heavy and light structural shapes, merchant and concrete bars, rods, universal and sheared plates, black, galvanized and blue annealed sheets, rivets and railroad track supplies.

Blast Furnace Capacity 965,000 Tons

At the Indiana Harbor works are four blast furnaces—No. 1 completed in 1907, No. 2 in 1912, No. 3 in 1917 and No. 4 in 1926. Their annual capacity is 965,000 tons. Steam is furnished by 10 boilers rated at 10,500 hp. The sintering plant has a yearly capacity of 35,000 tons, and the slag granulating plant of 650,000 tons. The by-product coke plant consists of 204 Koppers ovens with an annual capacity of 900,000 tons of coke and 3,000,000 gal. of light oils.

In the steel plant, which is completely electrified, is the following equipment: 14 100-ton and 12 60-ton basic open-hearth furnaces, a 600-ton mixer, 35 soaking pits, one 40-in., one 36-in. and one 32-in. blooming mills, a 28-in. rail and structural mill, a 24-in. billet and sheet bar mill, a 24-in. jobbing shape mill, a 24-in. Morgan continuous sheet bar and billet mill, a 24-in. Morgan continuous billet and slab mill, an 18-in. merchant mill, an 11-in. to 8-in. Morgan continuous bar mill, a 32-in. sheared plate mill, two jobbing mills, 16

(*Concluded on page* 369)

CONTENTS

February 2, 1928

Stampings Welded Into Complex Units 321
Accurate Control of Rolling Speeds 325
New Plant Widens Scope of Output 328
Prices of Steel and Other Products 330
Superhardening of Heat-Treated Steel 332
Low-Cost Pig Iron Means Highest Output 334
Price Cutting Threatens Prosperity 341
Youngstown-Inland Merger Agreed Upon 342
Sharp Gain in Pig Iron Output in January 349
Year's Exports Highest Since 1921 379

Truscon Steel Co. to Build $350,000 Plant in Europe 354
Railroad Freight Rates 349, 364, 366
Mr. Grace Urges Study of Selling 372
Orders for Russian Railroad Equipment 372
Pacific Coast Fabricating Plants 372
Economic Survey Sponsored by Mr. Hoover 376
Commodity Price Movements Present Confused Picture of Future 376
Simplified Practice Results in Large Saving to Industry 376
Rust Checks Rusting 377
Dunbar No. 1 Furnace Being Scrapped. 377
Steel Shipped 236 Miles by Airplane ... 378
Operation of Industrial Locomotives 380
New Trade Publications 390

NEW EQUIPMENT

Reducing Tube Mill for Seamless Tubing 333
Automatic Chucking Machine 336
Roll Grinder 338
Double-Action Press for Heavy Metal .. 339
42-In. Heavy Engine Lathe 340

STATISTICAL

Shifting Currents in Pig Iron Imports .. 354
Foundry Equipment Orders 357
Steel Corporation Fails to Earn Common Dividends 361
Lead and Zinc in 1927 375
Manganese Ores in 1927 375
Canadian Pig Iron Output in 1927 375
Shipbuilding Shows Gain 376
Russian Iron and Steel Output 376
Where Steel Exports Went in 1927 381
Machinery Exports in 1927 382

MEETINGS

Engineers Society of Western Pennsylvania 372
Compressed Gas Association 377

DEPARTMENTS

Editorial 346
Iron and Steel Markets 350
Comparison of Prices 351
Prices, Raw and Finished Products .. 353-355
Non-Ferrous Metals 367
Railroad Equipment Buying 368
Reinforcing Steel Business 368
Structural Awards and Projects 369
Personals 370
Obituary 371
European Steel Markets 373
Machinery Markets 383

This Issue in Brief

Changes losses into profits for an entire industry by solving distribution problem. Instead of competing with distributers, the bolt, nut and rivet manufacturers cooperate with them. Antagonism has given way to support, prices have been stabilized, and the industry has been put on a profit-making basis.—Page 378.

Thin film of rust acts as a protective coating to prevent further corrosion. All metal surfaces corrode a little, says metallurgist. Rust-resisting metals owe their noncorrodibility to the fact that a protective film forms on the surface and automatically brings to an end corroding action.—Page 377.

Superhardens steel parts by subjecting them to shower of small steel balls. Tiny blows work-harden the steel and produce a thin, super-hardened layer. Soft spots in hardened articles are readily revealed, as the steel balls will clearly mark any unhardened surface.—Page 333.

America sold less steel abroad in 1927 than in 1926, but bought more. Steel exports were 1.69 million gross tons, 8 per cent below 1926. Imports were 398,385 tons, 1.5 per cent above 1926.—Page 379.

Industrial locomotive tests reveal that coal consumption is 572 lb. an hour. Under steady operation water consumption is 450 gal. an hour.—Page 380.

Iceless refrigerating units made almost wholly of welded stampings and thin-walled tubing. Welding is found to be especially suitable in making gas-tight joints.—Page 321.

Low-cost pig iron means large-hearth blast furnaces. Big furnaces have justified themselves, for they operate easily and economically, says blast furnace superintendent. Prophesies that 1000-ton per day furnace will soon be here.—Page 334.

Synchronizes motor speeds by means of electric interlock. Individual balance type vibrating speed regulators govern speed of motors on new Bourne-Fuller rolling mill, so that bars are kept under tension but are not stretched or looped between passes.—Page 326.

Can prices come down to pre-war levels? Many things probably never will approach again the 1913 figures, with enhanced wages and higher taxation.—Page 332.

Millions saved in manufacturing economies have been wasted in faulty distribution methods. Reaction has set in, says trade association head, and business is beginning to devote to distribution the attention it deserves.—Page 378.

Sizable gain is made in pig iron output. Estimated daily production in January was 92,467 tons, a gain of 5507 or 6.3 per cent over December. Estimates indicate that the increase in number of furnaces in blast is 16, largest gain in two years.—Page 349.

One-half of all corporations lost money in 1927, says Bolt, Nut and Rivet Manufacturers' Association head. The problem of making industry profitable for the majority must be solved if labor conditions are to be stabilized and buying power maintained.—Page 341.

Foreign purchases of American machinery steadily increasing. We sold 435.5 million dollars' worth of machinery abroad in 1927, a gain of almost 9 per cent over 1926, and the second only to 1920, when prices were considerably higher.—Page 382.

Are prices governed by percentage of productive capacity operating? No, indicates editorial writer, for in some finished steel products one branch may operate at a higher rate than others and yet have poorer prices.—Page 346.

"Of what value is all our efficiency in production if we do not distribute efficiently, economically and effectively?" asks Eugene G. Grace. Urges engineers to study merchandising and distributing problems.—Page 372.

Ten companies now control about 82 per cent of the steel-making capacity of the United States. Recent mergers further concentrate steel production among the large producers. Five companies have more than two-thirds of the total capacity.—Page 347.

Activity in automotive industry is steadily growing. Increase in volume of steel bookings in Detroit area has been running about 4 per cent a week since early in January. Ford payroll now numbers 89,788 workers.—Page 366.

Prices of metals and metal products relatively low compared with pre-war figures. The average is only 23.2 per cent above 1913, while the average of all commodities is 45.5 per cent, or twice as high.—Page 330.

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor* W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York
C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred C. Stevens, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: 408 Union Central Building. Buffalo: 835 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.
PRINTED IN U. S. A.

Prices and Productive Capacity

PRODUCERS of almost any commodity are prone to regard price cutting in their selling market as fundamentally due to an excess of productive capacity. Those who assert that market troubles arise from the efforts of competitors to operate at higher rates than the state of demand permits really take the same ground. The common saying is that producers are "trying to secure an economical operation."

If a proper study could be made it probably would be found that several important influences induce price cutting or prevent prices from advancing to a level fair to the producers. Certain facts are obvious from a rapid survey. One is that the amount of price cutting or the unsatisfactoriness of prices in different commodities is not in direct relation to the apparent excess of capacity. In finished steel products one branch may operate at a higher rate than another and yet have poorer prices. Similar instances can be found among the manufacturing consumers who are customers of the steel mills.

Another case in point is the custom of measuring the steel industry's operation in terms of percentage of steel ingot capacity, even though steel ingots are the one commodity the steel industry does not sell. Its sales are of finished products and of semi-finished steel, each line having its individual market. It is common knowledge that the total rolling and finishing capacity in the United States is quite in excess of the total ingot-making capacity. If demand should mount in all lines relative to the respective finishing capacities a point would soon be reached calling for the full ingot tonnage without the finishing departments' being able to run full.

While most manufacturers would seek a higher operation to reduce unit cost, this idea should be more critically examined. It is illogical, for the simple reason that there is no critical rate of operation which brings a disproportionately sharp reduction in costs. Costs are better at 60 per cent than at 50 per cent and likewise they may be better at 90 per cent than at 80 per cent. Andrew Carnegie went further, endeavoring to sell more than assumed capacity and then driving mills to break their records Nowadays mills seldom succeed in getting a higher operating rate at the expense of competitors. But who will say that if they did they would not be tempted to try to go further and further, courting an encounter with the impossible?

Price cutting is often blamed on especially severe competition in one or more lines. Of course there are chance differences in personnel in various industries, but these differences are commonly overestimated. Some industries do have less intelligent and more aggressive competitors than others. But human nature is much the same all around, and if the personnels were exchanged it is probable that the marketing conditions might stay much the same.

In the case of steel mill products a very important price factor is that mill customers must resell the bulk of the tonnage in their respective markets, and these markets have their individual difficulties. For this reason a group of consumers may slip into a lower market and call upon the mills for relief or, faced by a mill demand for higher prices, may feel themselves unable either to absorb the advance or to pass it along. Thus the mills have a definite stake in influencing their customers to seek better prices.

AMERICAN machinery was shipped abroad in 1927 in greater quantity than ever before. Expressed in dollar values 1920 was higher, but the margin of $28,000,000—6½ per cent—was much less than the enhancement of prices in the immediate post-war period. The total exports in the year just closed were $435,476,000. This compares with a shade under $400,000,000 in the preceding year and with $463,000,000 in 1920. Since 1922, when the total was $239,000,000, there has been a continuous and fairly uniform gain year by year. This increment has averaged $39,000,000 a year. As recently as 1916 a new high record was made at $226,500,000, which was reported as far in excess of any preceding year. That the shipments were so high in 1927 was due in part to record exports of agricul-

tural machinery; shipments of machine tools in 1927 almost doubled the total registered in 1926.

Steel Mergers and Steel Output

NOW that the merger of the Youngstown Sheet & Tube Co. and the Inland Steel Co. is virtually assured and the purchase of the Trumbull Steel Co. by the Republic Iron & Steel Co. has been ratified by stockholders, the grouping of large units of steel production has been carried to a point where ten companies will control about 82 per cent or 47,497,000 tons, out of the 58,000,000 tons per annum of theoretical steel-making capacity in the United States. Five of these companies have total capacity of almost 41,000,000 tons, the smallest of the group being rated at nearly 2,000,000 tons, while in a secondary group are five other producers whose totals are between 1,000,000 and 1,750,000 tons each. The ingot capacities of the ten companies are:

	Tons
United States Steel Corporation	23,046,000
Bethlehem Steel Corporation	7,900,000
Youngstown-Inland Corporation	5,040,000
Jones & Laughlin Steel Corporation	3,000,000
Republic-Trumbull companies	1,950,000
American Rolling Mill Co.	1,750,000
Central Alloy Steel Corporation	1,400,000
Wheeling Steel Corporation	1,273,000
Colorado Fuel & Iron Co.	1,138,000
Corrigan, McKinney Steel Co.	1,000,000
Total	47,497,000

If the Youngstown-Inland and Republic-Trumbull properties should be brought together later under one ownership, a possible development toward which there is as yet no definite move, the total ingot capacity of the combination, amounting to 6,990,000 tons, would still be exceeded by the Bethlehem Steel Corporation's rating of 7,900,000 tons.

Of a little less than 11,000,000 tons of ingot capacity that is left to all of the steel companies not included in the ten above listed, there are thirteen whose totals range between 300,000 and 1,000,000 tons a year. These are:

	Tons
Crucible Steel Co. of America (including Pittsburgh Crucible Steel Co.)	950,000
International Harvester Co.	700,000
Lukens Steel Co.	686,500
Pittsburgh Steel Co.	600,000
Weirton Steel Co.	570,000
Donner Steel Co.	540,000
Alan Wood Iron & Steel Co.	529,000
Otis Steel Co.	421,000
Sharon Steel Hoop Co.	400,000
Interstate Iron & Steel Co.	375,000
Granite City Steel Co.	360,000
Bourne-Fuller Co.	300,000
Andrews Steel Co.	300,000
Total	6,731,5

While most of these thirteen companies make only one or two products each, instead of the diversified lines in which the larger groups are engaged, they are well distributed geographically and help to preserve a competitive situation which allays any fear of monopolistic tendencies in steel production. Recent industrial history confirms the opinion, before expressed in these columns, that large consolidations of capital and facilities have brought with them a greater degree of responsibility toward the public, including that share which purchases the products of the steel mills.

The smaller manufacturing units in the steel industry, although numerically of importance, own only 6½ per cent of the total steel-making capacity. It is in this group, however, that mergers may now be looked for, such as the one recently consummated by six Ohio sheet companies under the name of the Empire Steel Corporation. This company, while having only 185,000 tons of steel-making capacity, has upward of 400,000 tons of finished steel capacity when relying upon other companies for some of its raw product.

In the major steel products—rails, plates, shapes, bars, tubular goods, sheets and wire rods—the five leading producers under the new line-up will predominate to a degree which is well illustrated by the following table, giving in the first column the collective capacities of the five companies and in the second column the estimated capacities of all plants combined:

	Combined Capacity of Five Leading Producers, Tons	Estimated Capacity of All Producers, Tons
Rails	3,672,000	4,529,500
Plates	5,119,000	6,877,000
Shapes	3,784,000	4,434,000
Bars, hoops, bands, etc.	9,148,000	18,048,100
Tubular goods	3,646,000	5,501,500 (welded and seamless)
Sheets and tin mill black plate	3,645,000	8,710,700
Wire rods	2,886,000	4,494,800

In the Chicago district the Youngstown-Inland combine will have 240,000 tons of rail-making capacity out of a total of 1,373,000 tons; 330,000 tons in plates of a total of 1,566,000 tons; 285,000 tons in shapes of 914,000 tons; 360,000 tons in bars, hoops, bands, etc., of 3,732,000 tons; 265,000 tons in sheets and light plates of 530,500 tons; 312,000 tons in pipe of 738,000 tons. Tubular products lead in the capacity at Youngstown, with 600,000 tons.

The acquisition of the Trumbull company will give the Republic Iron & Steel Co. a total of about 650,000 tons in bars, strips, hoops and bands and 260,000 tons in sheets.

Seamless Pipe Lines Next

SUPPLANTING of welded pipe by the seamless product is progressing steadily and the manufacture of seamless pipe up to 24 in. in diameter, which means an invasion of the pipe line field hitherto controlled by the welded product, is now at hand. This development will repeat history.

Some years ago seamless steel captured the boiler tube market, and the demand for welded steel and welded iron tubes is now small by comparison with what it was a decade ago. Seamless drill pipe and casing have also been making a constantly stronger bid for use in oil and gas wells, and are now being used almost to the exclusion of welded pipe in Western fields and other producing districts where the oil lies at great depths below the surface

and is reached only after piercing thick strata of rock.

Up to date none of the seamless pipe manufacturers in this country has made pipe more than 13 in. in outside diameter; 10 in. has been the more common limit. In this respect, European producers have been turning out sizes up to 20 in. in diameter by a process different from that likely to be used in this country. It is generally conceded that American manufacturers have found best success after supplanting the European method of making a large tube with what is popularly referred to as the "automatic" mill, and there is little doubt that the future development for tubes up to 24 in. in diameter will follow along this line. Two installations of this sort are now in contemplation in the Pittsburgh district which will increase the size to 24 in. in diameter. Plans are under way for even larger seamless pipe for high-pressure work, and like tubular products demanding high-class metal without welds.

Profits from Collateral Advantages

NEARLY 50 years ago it was proved that solid carbon dioxide could not compete with water ice as a refrigerant. Mathematicians skilled in thermodynamics demonstrated that, while it would absorb twice as much heat and was therefore worth twice as much, carbon dioxide ice required much more than twice as much energy to solidify it as it took to freeze water. In other words, it would cost more to make it than it could be sold for. Therefore men looking for new business ventures turned to other lines of endeavor.

But more recently some others (who perhaps were unaware of the scientific reasons why they couldn't succeed) manufactured some solid carbon dioxide and marketed it under the trade name of "dry ice." In a short time in actual use it was found that instead of replacing twice its weight of ice, as theory indicated, in certain services it replaced ten times its weight! The thermodynamical demonstration wasn't wrong, but the theoretical computer did not realize that the gas evaporating from the refrigerant was itself an excellent insulator against outside heat. Other collateral advantages, such as lower shipping weights and ability to use one-time paper containers, have warranted many consumers to pay enough for the new refrigerant to make its production a profitable business.

This is not written with the intent of advertising dry ice, but to indicate what an essential part collateral advantages play in successful marketing. If solid carbon dioxide had the same utility as water ice (as assumed by the physicists of last century) it could not compete. But unsuspected utilities, the collateral advantages of the substance, enhanced its value.

In fact, collateral advantages are the selling points which market most modern devices. Old but usable equipment is made obsolete by newer designs with collateral advantages. Possession of a washing machine and steam dryer does not mean that the laundress's wages will be less than if she worked with a wash tub, boiler and clothes line; the collateral advantage to the owner is that the housewife thereby becomes less dependent upon the laundress's whims. An oil furnace isn't particularly cheap, either to install or operate, but it is far more comfortable to set a clock and thermostat in the evening than it is to rise early in the cold morning and shake down the grates.

These homely illustrations serve to fortify the point that selling purely on a price basis is not so profitable as when the article or commodity has valuable collateral advantages which warrant a premium. Obviously various metal industries will do well to extend this principle of marketing to their own production. Not that it hasn't been done already, but the principle is worthy of wider and more intensive application, and warrants some extensive studies by many producers.

Certain instances come to mind. Malleable castings get preference when their easy and uniform machinability is properly appreciated. The copper and brass industry is marketing increasing amounts of pipe, sheets, and moldings on the basis of permanence and beautiful surface—frequently an entirely collateral advantage where the expected life of the structure is limited. Such collateral advantages of all-steel car bodies as "squeaklessness" and safety in collision warrant their adoption for automobiles no less than passenger cars and at a higher price. Broad-flanged beams, the so-called H-beams, effect such economies in the design and fabrication of structural steel work that they often get a premium over the older I-beam sections.

Prosperous is the industry that can find these collateral advantages for its product, and is astute enough to charge its customers for values received.

Why Our Capital Leaves Home

OUR large and increasing foreign loans have created various strong reactions, but one of the important phases of the movement has received slight attention. It is commonly overlooked that these loans furnish a test of our own industrial progress and show it to be less than might well be desired.

The strongest reaction to the outflow of capital has been one of criticism. It is charged that if we continue this lending the returns earned cannot come in, for in the long run, it is said, they would have to be in kinds of merchandise that we do not wish to import. Suspicions have been expressed that we have been slipping into the lending of additional sums to cover interest and that the inevitable result will be a compounding of interest, uncollectable after a period of years.

These contentions cannot be dismissed. But, whereas this criticism began several years ago, it is encouraging to note that the net total of our loans last year was greatly in excess of the interest charges and the loans made a new high record. Estimates just made of foreign loans in 1927 minus redemptions run above one and a half billion dollars, making our total foreign investments at this time about 13 billions. Investments in the United States held abroad, however, probably total in excess of three billions.

Another strong reaction to this exportation of capital, one of criticism and indeed of complaint, has been that our lending to foreigners helps them industrially and will place them in a stronger competitive position, whereby our merchandise export trade may be injured.

These two points are well worth considering, and they have been considered. Another phase has received little attention, but it is very important:

How does it come about that capital is attracted abroad—why does it not stay at home? It has always been recognized that there is "a disinclination in capital to emigrate," and economists have even attempted to estimate the "disinclination," sometimes putting it as high as a 2 per cent difference in expected return.

In addition to the bare facts as to totals, there are two late trends—one, diminished profits from our home investments last year and, second, increased foreign loans. With a diminishing supply of capital, we export more! Emphatically, there is something to be looked into.

When this country was young, capital flowed into it and the process was considered natural. Have we now grown so old industrially that the rest of the world has an average age less than ours? There are data by which we may consider the point. The last Department of Commerce *Review* estimates private American investments abroad at the end of 1926 at $11,215,000,000, divided in the following proportions:

	Per Cent
Europe	26.8
Latin America	40.1
Canada and Newfoundland	25.0
Asia, Australia, Africa, etc.	8.1
Total	100.0

The division seems natural enough. Europe is old, Latin America and Canada are new, and industrially the rest of the world is in early stages.

If there were such a thing as a collective national mind, it would be natural to ask what eventual benefits we expect to derive from the investments, i. e., what do we expect to buy for ourselves with the money? It cannot be construction at home, or we should use the capital itself for constructing. It cannot be goods, for we do not want more foreign merchandise. The natural inference is that foreign loans are increasing because of a lack of opportunities for profitable investment at home.

Sharp Gain in January Pig Iron Output

Estimates, Collected by Wire, Show Daily Rate 5507 Tons or 6.3 Per Cent More Than December—Net Gain of 16 Furnaces

PRELIMINARY estimates of the January pig iron production, gathered by wire on Tuesday, Jan. 31, indicate a sharp increase over December. With the output for the last day or two calculated by producing companies, the production of coke pig iron last month was 2,866,468 gross tons, or 92,467 tons per day. This compares with 2,695,755 tons, or 86,960 tons per day, in December, also a 31-day month. The January increase in daily rate was therefore about 6.3 per cent.

The feature of the January operations was the net gain of 16 furnaces. The incomplete returns indicate that 20 furnaces were blown in and four blown out or banked. This is the largest net increase in many months, the nearest approach having been one of 14 furnaces in December, 1925. The United States Steel Corporation is credited with 13 of the 20 furnaces blown in, seven being Carnegie Steel Co. stacks and five furnaces located in the Chicago district. Only one Steel Corporation furnace was blown out, giving that organization a net gain of 12 stacks for the month. There were six independent steel company stacks blown in and two blown out, with one merchant furnace started up and one shut down. According to the data, there were 185 furnaces operating on Jan. 31.

Actual data for the January output will be published in THE IRON AGE Feb. 9. The table gives the estimated production by districts for January and the three months preceding.

Pig Iron Production by Districts, Gross Tons

	Jan. (31 days)	Dec. (31 days)	Nov. (30 days)	Oct. (31 days)
New York and Mass.	203,859	199,726	212,778	232,422
Lehigh Valley	74,575	74,316	75,748	81,829
Schuylkill Valley	43,784	44,238	53,269	64,260
Lower Susq. and Lebanon Valleys	30,528	32,289	30,150	31,828
Pittsburgh district	585,203	523,875	495,005	540,525
Shenango Valley	76,911	58,982	64,752	77,106
Western Penna.	89,226	92,774	92,000	93,010
Maryland, Virginia and Kentucky	94,087	92,981	91,300	88,991
Wheeling district	108,026	114,030	110,055	110,222
Mahoning Valley	248,445	222,572	223,617	245,625
Central and Northern Ohio	312,293	295,179	306,395	324,793
Southern Ohio	32,473	32,413	32,750	32,954
Illinois and Indiana	606,788	537,892	508,545	506,438
Mich., Minn., Mo., Wis., Colo. and Utah	130,160	140,141	126,287	121,203
Alabama	223,829	227,775	219,478	224,533
Tennessee	6,281	6,572	6,247	8,373
Total	2,866,468	2,695,755	2,648,376	2,784,112

Railroads Ordered to Revise Rate Provisions on Scrap

WASHINGTON, Jan. 31.—Railroads in Official Classification territory have been ordered by the Interstate Commerce Commission to revise present tariff provisions with respect to scrap iron and steel. The commission took this action in a decision made public last Friday in which it upheld a complaint of the Wrought Washer Mfg. Co., Milwaukee, against the assessment of rates on old material which in most instances were those applicable on manufactured iron and steel and were generally fifth-class rates. The complainant had asked application of scrap rates and sought reparation on that basis. The findings of the commission mark a victory for scrap iron dealers and consumers, who for a long period have held conferences with railroad representatives and with the commission, asking for revision of the existing provision which describes scrap iron as "scraps or pieces of iron or steel having value for remelting purposes only." The commission on numerous occasions has supported this definition.

In announcing the decision in the Wrought Washer case the commission tentatively suggested the following rule for consideration by the carriers:

> Rates apply on pieces of iron or steel, separate or combined and in their original form or otherwise, which are chiefly valuable for remelting or fagoting, which can not be damaged by breakage, and which can be transported in open cars without damage from exposure: Provided, however, that these rates will not apply on iron or steel which, although chiefly valuable for remelting purposes, is in the form of raw or unfinished material for which other rates are specifically provided.

The distinction between the present provision and the one proposed is that the latter does not limit the definition of scrap to material which is fit for remelting purposes only.

The Wrought Washer Mfg. Co. does not remelt old material, but reheats it, and after rerolling, shearing and sorting, makes washers from about 30 per cent, while the remainder is converted into washers without reheating. The commission held that the rates charged the company should not exceed the billet rate and called upon the railroads to apply the new rates beginning March 21. Reparation also was awarded.

Iron and Steel Markets

Prices, Output, Demand Increase

Advance in Wire Products Follows That on Plates, Shapes and Bars—Blast Furnace Operations Gain—Further Broadening of Consumption

A MARKED increase in blast furnace operations in January, fresh price advances and further evidences of heavier consumption reflect the growing strength of the steel market.

The rapidity of recent gains in steel mill operations is given fresh emphasis by the blast furnace statistics. A net gain of 16 active furnaces in the month, all of them steel works stacks, is indicated by telegraphic reports to THE IRON AGE on Jan. 31. The nearest approach to this increase in recent years was a gain of 14 furnaces in December, 1925.

The Steel Corporation alone blew in 13 furnaces in the month and put out one, a net gain of 12. The operations of this producer's plants now average 84 per cent, as against 82 last week and 75 three weeks ago.

Encouraged by expanding business and, no doubt, more determined to get better prices as a result of the poor showing of earnings for the last quarter of 1927, steel producers have announced fresh advances in quotations. Following the lead of the Steel Corporation subsidiary, all makers of wire nails and plain wire have marked up prices $2 a ton. Most of the leading producers of automobile body sheets have restored the former base of 4.15c., Pittsburgh, or $3 a ton above the recent ruling price, and there is more general acceptance of the $3 increase on cold-rolled strip announced by a leading mill two weeks ago.

The advance of Jan. 19 on plates, shapes and bars stimulated specifying and drove in considerable pending business. This reaction was most pronounced at Chicago, where the sales total for the week has been exceeded only twice in the past two years and the increase in specifications has pushed production up to 88 per cent of ingot capacity.

From Chicago also come more definite indications of the gradual abandonment of short-term buying. Diminishing caution on the part of consumers is reflected in longer commitments and corresponding improvement in mill scheduling.

Evidences of broadening demand are seen in the better showing in lines that have been lagging, notably pipe and tin plate. Pipe mill operations have increased to 70 per cent of capacity, as compared with 60 per cent a week ago. Three orders for line pipe in early prospect total 300,000 tons, one alone calling for 150,000 tons. An export inquiry for 15,000 tons of pipe is active, and an order has been taken by an independent producer for 4000 tons for Ontario, Canada.

In tin plate, specifications are expanding, and requirements this year, according to reports from the canners' convention in Chicago, promise to exceed those of 1927.

Wire mills are running at 70 per cent, which represents virtually a peak rate of operation in view of the surplus of producing capacity. Demand for wire products has improved materially, and some mills are booked for 30 days.

The automotive industry has reached a good rate of production, although not running at capacity. The payroll of the Ford Motor Co. numbered 90,000 as of Jan. 27, an increase of 4000 since Jan. 14.

Railroad buying remains a major market factor. A Western road has placed 14,000 tons of rails and Chicago mills are still figuring on 75,000 tons. The Central Railroad of New Jersey ordered 13,494 tons from the Bethlehem Steel Co. Track accessories booked at Chicago total 25,000 tons. The Pennsylvania Railroad has purchased 600 passenger cars, an unusually large order for such equipment, and freight cars bought by three roads number 1250. For repairs to 1000 cars the Norfolk & Western is inquiring for 8000 tons of plates and small shapes.

Out of nearly 45,000 tons of fresh structural inquiry, 27,000 tons is for railroad work. The Santa Fe alone will place 20,000 tons of bridge work. Awards of fabricated steel total 29,000 tons, including 4500 tons for a bridge at Vicksburg, Miss., and 3300 tons for New York subway work.

Pig iron shipments are increasing in some districts, reflecting better conditions among foundries, but sales, except at Cleveland, have not been conspicuously large. Lake Erie furnaces sold 24,000 tons in the week, much of it in small orders. Large stock piles on furnace yards are a deterrent to price advances. While current quotations are being fairly well maintained, there are occasional concessions on the larger tonnages, true particularly when furnaces of different districts meet in competition.

Total production of pig iron in January, according to preliminary estimates, was 2,866,468 gross tons, or 92,467 tons per day, a gain of 5507 tons or 6.3 per cent over the 86,960 tons per day in December. The net gain of 16 furnaces brought the total active at the end of the month to 185.

Exports of machinery from the United States in 1927 amounted to $435,476,591, a gain of 9 per cent over 1926, the largest total since 1920 and the second largest total ever shipped abroad. Machine tools exported from the United States in 1927 represented nearly double the value shipped in 1926, having been $12,538,313, against $7,104,277.

Finished steel, on the basis of THE IRON AGE composite price, has advanced to 2.336c. a lb., after holding at 2.314c. for six weeks. It is now higher than at any time since early last October, but is 2½ per cent below the level of a year ago. Pig iron remains for a third week at $17.67 a ton.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Jan. 31, 1928	Jan. 24, 1928	Jan. 3, 1928	Feb. 1, 1927
No. 2, fdy., Philadelphia..	$20.26	$20.26	$19.76	$21.76
No. 2, Valley furnace.....	17.25	17.25	17.25	18.50
No. 2, Southern, Cin'ti....	19.69	19.69	19.69	21.69
No. 2, Birmingham.....	16.00	16.00	16.00	18.00
No. 2 foundry, Chicago*..	18.50	18.50	18.50	20.50
Basic, del'd eastern Pa...	19.50	19.50	19.50	21.50
Basic, Valley furnace....	17.00	17.00	17.00	18.00
Valley Bessemer, del. P'gh	19.26	19.26	19.26	20.76
Malleable, Chicago*	18.50	18.50	18.50	20.50
Malleable, Valley.....	17.25	17.25	17.50	18.50
Gray forge, Pittsburgh...	18.51	18.51	18.51	19.76
L. S. charcoal, Chicago....	27.04	27.04	27.04	27.04
Ferromanganese, furnace.	100.00	100.00	100.00	100.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill.	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh..	33.00	33.00	33.00	33.00
Light rails at mill.....	36.00	36.00	36.00	36.00
O.-h. billets, Pittsburgh...	33.00	33.00	33.00	33.00
O.-h. sheet bars, P'gh....	34.00	34.00	34.00	34.00
Forging billets, P'gh.....	38.00	38.00	38.00	40.00
O.-h. billets, Phila.....	38.30	38.30	38.30	40.30
Wire rods, Pittsburgh....	42.00	42.00	40.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago.....	1.90	1.90	1.90	2.00
Steel bars, Pittsburgh....	**1.85**	1.80	1.80	1.90
Steel bars, Chicago.....	**1.95**	1.90	1.90	2.10
Steel bars, New York.....	**2.19**	2.14	2.14	2.24
Tank plates, Pittsburgh...	**1.85**	1.80	1.80	1.90
Tank plates, Chicago.....	**1.95**	1.90	1.90	2.10
Tank plates, New York...	**2.17½**	2.12½	2.12½	2.24
Beams, Pittsburgh	**1.85**	1.80	1.80	1.90
Beams, Chicago	**1.95**	1.90	1.90	2.10
Beams, New York.....	**2.14½**	2.09½	2.09½	2.24
Steel hoops, Pittsburgh...	2.20	2.20	2.20	2.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Jan. 31, 1928	Jan. 24, 1928	Jan. 3, 1928	Feb. 1, 1927
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.80	2.80	2.80	2.85
Sheets, black, No. 24, Chicago dist. mill.....	3.00	3.00	2.90	3.00
Sheets, galv., No. 24, P'gh	3.65	3.65	3.65	3.75
Sheets, galv. No. 24, Chicago dist. mill.....	3.85	3.85	3.70	3.85
Sheets, blue, 9 & 10, P'gh.	2.10	2.10	2.10	2.20
Sheets, blue, 9 & 10, Chicago dist. mill.....	2.20	2.20	2.15	2.35
Wire nails, Pittsburgh....	2.55	2.55	2.50	2.60
Wire nails, Chicago dist. mill	**2.60**	2.55	2.55	2.65
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.45
Plain wire, Chicago, dist. mill	2.45	2.45	2.45	2.50
Barbed wire, galv., P'gh..	3.25	3.25	3.20	3.30
Barbed wire, galv., Chicago dist. mill.....	3.25	3.25	3.25	3.35
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$14.00	$14.00	$13.50	$15.50
Carwheels, Philadelphia...	15.50	15.50	15.50	16.00
Heavy melting steel, P'gh.	*14.75*	15.00	15.50	16.50
Heavy melting steel, Phila.	13.50	13.50	13.50	15.00
Heavy melting steel, Ch'go	12.50	12.50	12.50	13.25
No. 1 cast, Pittsburgh....	14.50	14.50	14.50	15.75
No. 1 cast, Philadelphia..	16.00	16.00	16.00	17.00
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.00	16.50
No. 1 RR. wrot. Phila....	15.25	15.25	15.25	17.00
No. 1 RR. wrot. Ch'go (net)	11.00	11.00	11.00	12.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	*$2.60*	$2.65	$2.75	$3.25
Foundry coke, prompt....	3.75	3.75	3.75	4.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	14.25	14.25	14.25	13.25
Electrolytic copper, refinery	13.87½	13.87½	13.75	12.87½
Zinc, St. Louis.....	**5.67½**	5.65	5.65	6.57½
Zinc, New York.....	**6.02½**	6.00	6.00	6.92½
Lead, St. Louis.....	6.30	6.30	6.30	7.20
Lead, New York.....	6.50	6.50	6.50	7.40
Tin (Straits), New York..	*54.62½*	55.37½	57.75	66.50
Antimony (Asiatic), N. Y.	**11.25**	11.00	11.00	14.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Price Advances on Wire Products and Auto Body Sheets

PITTSBURGH, Jan. 31.—The steel trade has been engaged in consolidating its gains and in building its price line for second quarter business. Strip steel producers have stronger price ideas on the hot-rolled product and the advance announced a week ago by a large maker of cold-rolled strips has since been followed by all other manufacturers. An advance of $3 a ton has been announced on automobile body sheets to 4.15c. per lb., and this has been accompanied by a stronger effort to place the market on the basis announced several weeks ago, but which had not been attained because of the willingness of some mills to take additional orders at the prices ruling in December. Another swing in the same direction is an advance of $2 per ton in wire and wire products, applying to all except woven wire fence.

Since the mills are heavily committed for this quarter in these several products, the price changes can be interpreted as indicating that steel manufacturers are determined to place second quarter business upon a more profitable basis than that now passing through the mills. The advance of Jan. 19 on plates, shapes and bars has continued in the past week to stimulate specifications on old business and to bring in contracts from buyers who were inclined to withhold signing them in the belief that they would do as well on spot purchases. Not a mill in this district now has a price of less than 1.85c., on plates, shapes and bars, and while comparatively little business is being done at that figure, mills will go no lower on new orders and there is strong possibility that a further advance may be sought as the time comes for writing second quarter tonnages.

Business in bars, plates and shapes has improved materially as buyers have become convinced of the firm intention of manufacturers to get at least a fair profit for their steel. There has, however, been no change in the general attitude of purchasers toward the market and the fact that it is still difficult to schedule rolling mills more than a week ahead is evidence that many buyers still believe in the buying-for-consumption policy.

Specifications against old and lower-priced orders in other products continue to come in well and the trend of both steel works and rolling mill operations continues upward. For this and nearby districts, ingot production may now be placed at between 75 and 80 per cent of capacity. The Carnegie Steel Co. has added six blast furnaces to its active list since a month ago, while the Pittsburgh Crucible Steel Co. and Republic Iron & Steel Co. each has put on one furnace.

Activity still is lacking in pig iron, scrap and fuels, and while iron prices hold steady, presumably because of slightly less steel company selling, prices of the other materials are soft.

Pig Iron.—Only a small-lot business is being done in pig iron. Some fair-sized tonnages of basic iron, sold by one steel company to another, have been moved, but this business is largely non-competitive, except that the seller has had to make prices more attractive than the nominal quotation of Valley furnaces. The buyer gets the benefit of a considerable saving of freight as between the shipping furnace and those in the Valleys. In Bessemer, foundry and malleable iron,

sales have been chiefly in one or two car lots and at recent prices. Agents of charcoal iron producers have written up considerable business with roll makers for shipments over the first half of the year and it is estimated that the amount is close to 10,000 tons.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$17.00
Bessemer	17.50
Gray forge	16.75
No. 2 foundry	17.25
No. 3 foundry	16.75
Malleable	$17.25 to 17.50
Low phosphorus, copper free	27.00

Freight rate to the Pittsburgh or Cleveland district, $1.76.

Ferroalloys.—Steel manufacturers seem to have largely supplied their immediate needs of ferromanganese by purchases and specifications in December to escape the price advance. Current shipping instructions embrace only moderate tonnages. Consumers in this district do not take seriously the reports that higher prices for ferromanganese are immediately ahead.

Semi-Finished Steel.—There is a fairly good movement of billets, slabs and sheet bars in keeping with the fact that the non-integrated sheet, tin plate and strip mills now are having a good operation. Little of the business in these forms, however, is subject to open market competition, buyers being satisfied to adhere to regular sources of supply. Wire rods have been advanced $2 a ton along with the advance in wire and wire products, the new quotation being $44, base Pittsburgh or Cleveland. Pipe skelp is priced at 1.85c., but there is hardly enough business to provide a test.

Bars, Plates and Shapes.—While no considerable amount of business yet has been done at the advanced price recently announced, the market does not appear quotable at less than 1.85c., since all makers in this and nearby districts now are quoting that figure, and they are strengthened in their price position by the heavy accessions to order books resulting from the advance. Bar orders have notably increased in the past week or 10 days. In plates and shapes there is also evidence that buyers take seriously the stand manufacturers lately have been taking on prices. Structural steel inquiry is fairly good, but awards are rather light. The Norfolk & Western is asking prices on approximately 8000 tons of plates and small shapes for repairs to 1000 cars.

Rails and Track Supplies.—The order book of the local standard-section rail producer was further swelled by the distribution of the Nickel Plate order. That road is yet to act on its inquiry for spikes and tie plates. In general, the demand for track supplies is a little slow, but most makers have fair-sized orders booked for late shipment. Spike prices are irregular and easy, but on tie plates and rails prices are well maintained.

Wire Products.—The American Steel & Wire Co., as of Jan. 25, advanced all wire products, except woven wire fence, $2 per ton, putting nails to $2.65, base, per keg, Pittsburgh or Cleveland, and plain wire to $2.50, base, per 100 lb., those points. Other makers have since followed suit. The effect of the advance has been to stimulate specifications on first quarter contracts carrying the former prices and to drive to cover a good many buyers who had not signed contracts for this period. Jobbers still have low-priced tonnage, notably nails, coming to them on orders placed late last year and now will have access to first quarter contract tonnage. It will take a little time for these supplies to get into consumption and the common belief is that the new prices will not be fully effective before the second quarter.

Tubular Goods.—There is a steady, although gradual, increase in the demand for standard-weight pipe, but no appreciable gain is observed in the orders for oil country goods, except possibly from California, where there is fairly extensive drilling of old fields in the expectation of tapping oil at depth. This demand helps particularly the sale of seamless casing and drill pipe. Reports from the oil industry are more cheerful, with reports of a premium being offered for the high gravity oil of the Seminole, Okla., field. An effort now is being made to extend the curtailment program in that field for another three months. No less than 2000 miles of line pipe is embraced in gas pipe line projects now under consideration. There are lines projected from Amarillo, Tex., to Omaha and to Kansas City; from Monroe, La., to St. Louis; from Wyoming to San Francisco and from the latter city to Los Angeles. Pipe prices still show some irregularity.

Sheets.—Makers generally are taking a firmer stand on prices and most of the leading producers of automobile body sheets have since a week ago restored the former base price of 4.15c., Pittsburgh, while almost all makers have taken a stand at 2.90c., base Pittsburgh, on black, 3.75c., base, on galvanized, 2.10c., base, on blue annealed under 40 in. wide, and 2.20c., base, on sheets wider than 40 in. These prices may be regarded as second quarter quotations, since the mills generally are so well obligated, and, by the same token, buyers are so well covered for this quarter that not much possibility exists for the higher prices to become effective promptly. Buyers are specifying well, but new business is light.

Tin Plate.—Reports from the canners' convention in Chicago suggest a common belief that the excess stocks of canned fruits and vegetables will be pretty well used up before the new crops come in. The natural inference is that tin plate requirements will be greater this year than last. At present there is expanding tendency in specifications on contracts and mill operations easily average 75 per cent of capacity.

Cold-Finished Steel Bars and Shafting.—Business holds up remarkably well and is being helped by the fact that a good many buyers who did not believe that the advance announced for this quarter would hold have been impressed by the recent advance in hot-rolled bars.

Hot-Rolled Flats.—Makers are growing stronger in their price ideas, and while there continues to be business at 1.85c., base, for wide material and 2.05c., for narrow, most makers now regard 1.90c. and 2.10c. as their minimum. Specifications on old orders are coming in well.

The Iron Age Composite Prices

Finished Steel

Jan. 31, 1928, 2.336c. a Lb.

One week ago	2.314c.
One month ago	2.314c.
One year ago	2.396c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 86 per cent of the United States output of finished steel.

	High		Low	
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	Apr. 24;	2.446c.,	Jan. 2

Pig Iron

Jan. 31, 1928, $17.67 a Gross Ton

One week ago	$17.67
One month ago	17.54
One year ago	19.21
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1927	$19.71,	Jan. 4;	$17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	Mar. 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c.
F.o.b. Chicago	2.05c.
Del'd Philadelphia	2.17c.
Del'd New York	2.19c.
Del'd Cleveland	2.04c.
F.o.b. Cleveland	1.85c.
F.o.b. Lackawanna	1.95c.
F.o.b. Birmingham	2.10c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	1.90c. to 1.95c.
F.o.b. Birmingham	2.05c. to 2.15c.

Rail Steel

F.o.b. mills east of Chicago district	1.65c. to 1.70c.
F.o.b. Chicago Heights mill	1.80c.

Iron

Common iron, f.o.b. Chicago	1.90c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.10c.
Del'd Cleveland	2.04c.
Del'd Philadelphia	2.10c.
F.o.b. Coatesville	2.00c.
F.o.b. Sparrows Point	2.00c.
F.o.b. Lackawanna	1.95c.
Del'd New York	2.17½c.
C.i.f. Pacific ports	2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills	1.85c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.10c.
F.o.b. Lackawanna	1.95c.
F.o.b. Bethlehem	2.00c.
Del'd Cleveland	2.04c.
Del'd Philadelphia	2.13c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, 2 in. and narrower, P'gh	2.10c. to 2.20c.
All gages, wider than 2 in., to 6 in., P'gh	2.05c. to 2.10c.
*All gages, 6 in. and wider, P'gh	1.85c. to 1.90c.
All gages, narrower than 6 in., Chicago	2.20c. to 2.40c.
All gages, 6 in. and wider, Chicago	2.00c. to 2.20c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.20c.
Bars, f.o.b. Chicago	2.20c.
Bars, Cleveland	2.25c.
Shafting, ground, f.o.b. mill	*2.45c. to 2.90c.
Strips, under 12 in., 1 up to 3 tons, P'gh	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, Cleveland	3.00c. to 3.15c.
Strips, under 12 in., 1 up to 3 tons, del'd Chicago	3.30c. to 3.45c.
Strips, under 12 in., 1 up to 3 tons, Worcester	3.25c. to 3.40c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galvanized nails	4.65
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.10c. to 2.20c.
Nos. 9 and 10, f.o.b. Chicago dist. mill	2.20c. to 2.30c.
Nos. 9 and 10, del'd Cleveland	2.29c.
Nos. 9 and 10, del'd Philadelphia	2.42c. to 2.52c.
Nos. 9 and 10, f.o.b. Birmingham	2.25c. to 2.30c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.80c. to 2.90c.
No. 24, f.o.b. Chicago dist. mill	3.00c.
No. 24, del'd Cleveland	3.09c.
No. 24, del'd Philadelphia	3.12c. to 3.22c.
No. 24, f.o.b. Birmingham	3.05c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade	3.95c. to 4.05c.
No. 24, f.o.b. Pittsburgh, B grade	3.75c. to 3.85c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.65c. to 3.75c.
No. 24, f.o.b. Chicago dist mill	3.85c.
No. 24, del'd Cleveland	3.84c. to 3.94c.
No. 24, del'd Philadelphia	3.97c. to 4.07c.
No. 24, f.o.b. Birmingham	3.90c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.00c. to 3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	4.00c. to 4.15c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes	4.10c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.25
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.35

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. Pittsburgh, Chicago or Ohio Mill)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$2.90 to $3.00
2300	(3½% Nickel)	4.00 to 4.10
2500	(5% Nickel)	5.00 to 5.25
3100	(Nickel Chromium)	3.00 to 3.10
3200	(Nickel Chromium)	4.75 to 5.00
3300	(Nickel Chromium)	6.75 to 7.00
3400	(Nickel Chromium)	6.00 to 6.25
5100	(Chromium Steel)	3.00 to 3.10
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.00 to 4.15
6100	(Chrom. Vanad. spring steel)	3.50 to 3.75
9250	(Silicon Manganese spring steel)	3.00 to 3.15
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.05 to 4.20
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.00 to 4.25
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.05 to 3.10
	Chromium Molybdenum spring steel (1 — 1.25 Chrom., 0.30 — 0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½ in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base Per 100 Lb
Spikes, ⅜ in. and larger	$2.70 to $2.80
Spikes, ½ in. and smaller	2.70 to 2.80
Spikes, boat and barge	2.90 to 3.00
Tie plates, steel	2.25
Angle, bars	2.75
Track bolts, to steam railroads	3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count,	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	19
1 to 3	62	50½			

Lap Weld

2	55	43½	2	28	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	13
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+54
¼ to ⅜	47	30½	½	21	17
½	53	42½	¾	28	13
¾	58	47½	1 to 1½	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	28	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	15
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5 and 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	27	1½ in.	+12
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 2
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Beyond the above discounts, 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1⅜ in.	52	3¼ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾	39		

Hot Rolled

2 and 2¼ in.	37	3¼ and 3½ in.	53
2½ and 2¾ in.	45	4 in.	56
3 in.	51	4½, 5 and 6 in.	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

Cold-Rolled Strips.—All makers in this district have gone along with the advance announced a week ago by the American Steel & Wire Co. of 3.15c., base, for lots of 1 to less than 3 tons, subject to a deduction of 25c. per 100 lb. for lots of 3 tons or more. Specifications are good on old orders.

Old Material.—The market still is dull and easy. While it is doubtful that any consumer could buy heavy melting steel at less than $15, it is a fact that none will pay more and dealers have succeeded in picking up fair-sized lots for delivery at one point in the district at $14.75. The general market may be appraised at $15 for this grade, with variations either way in keeping with the destination. Blast furnace scrap is weak and $11 is about all that can be obtained. The February scrap list of the Baltmiore & Ohio contains 14,150 gross tons and that of the Norfolk & Western 4100 gross tons.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:	
Heavy melting steel	$14.75 to $15.25
Scrap rails	14.25 to 14.75
Compressed sheet steel	14.00 to 14.25
Bundled sheets, sides and ends	13.00 to 13.25
Cast iron carwheels	14.00 to 14.50
Sheet bar crops, ordinary	15.00 to 15.50
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	14.75 to 15.25
Heavy steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Acid Open-Hearth Furnace Grades:	
Railroad knuckles and couplers	16.75 to 17.00
Railroad coil and leaf springs	16.75 to 17.00
Rolled steel wheels	16.75 to 17.00
Low phosphorus billet and bloom ends	18.50 to 19.00
Low phosphorus, mill plate	17.50 to 18.00
Low phosphorus, light grade	16.50 to 17.00
Low phosphorus sheet bar crops	17.50 to 18.00
Heavy steel axle turnings	13.00 to 13.50
Electric Furnace Grades:	
Low phosphorus punchings	16.50 to 17.00
Heavy steel axle turnings	13.00 to 13.50
Blast Furnace Grades:	
Short shoveling steel turnings	11.00
Short mixed borings and turnings	11.00
Cast iron borings	11.00
No. 2 busheling	10.00 to 10.25
Rolling Mill Grades:	
Steel car axles	18.00 to 19.00
No. 1 railroad wrought	11.00 to 11.50
Sheet bar crops	17.00 to 17.50
Cupola Grades:	
No. 1 cast	14.50 to 15.00
Rails 3 ft. and under	15.00 to 15.25
Malleable Grades:	
Railroad	14.75 to 15.25
Industrial	14.25 to 14.75
Agricultural	13.75 to 14.25

Bolts, Nuts and Rivets.—Better demand is developing for bolts and nuts from the railroad car builders. Jobbers also are specifying with a little more freedom. Rivets still are slow. Prices are firm on all products.

Coke and Coal.—Declining production of soft coal does not bridge the gap between supply and demand and prices still are weak under the effort of producers to find a market. Lump gas coal, nominally priced at $2.10 per net ton at mines, has sold at $2 and even less in some cases. Slack coal again is plentiful and down in price. The coke market still suffers from limited demand. Light offerings of beehive oven coke do not stay the decline in prices because by-product coke still is freely obtainable. Single carloads of beehive oven furnace coke can be sold at $2.75, but on large lots $2.65 is about all that can be obtained. Foundry coke ranges from $3.75 to $4, with occasional sales of especially good brands at a little more.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
•Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.65c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.10c.
Galvanized corrugated sheets (No. 28 gage), per square	$4.39
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	62½ per cent off list
Machine bolts, per 100 count.	62½ per cent off list
Carriage bolts, per 100 count.	62½ per cent off list
Nuts, all styles, per 100 count,	62½ per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft annealed, base per 100 lb.	$3.00 to 3.10
Wire, galvanized soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Shifting Currents in Pig Iron Imports

Imports of pig iron in December, at 14,299 tons, showed a decline of less than 4 per cent from December, 1926, in spite of the fact that imports for the calendar year 1927 were less than 30 per cent of the corresponding total in 1926. December imports in 1927 were nearly one-seventh of the total for the first 11 months, whereas in 1926 the December tonnage was only one-twenty-ninth that of the 11 months.

India furnished more than half the total incoming tonnage in December, contrasted with only 203 tons last year. In December, 1926, Germany furnished more than two-thirds of the total, contrasted with none a year later. As a matter of fact, Germany's pig iron shipments reaching the United States in December, 1926, were greater than the total from Germany reaching the United States in the entire year 1927.

In the 12 months India has furnished us with just over half our total imports. Netherlands has supplied almost half the remainder and Great Britain more than half that not furnished by India and Netherlands. In contrast with this, Germany led in 1926 with more than one-third the total. Great Britain was second, India third, and Netherlands fourth.

UNITED STATES IMPORTS OF PIG IRON, BY COUNTRIES OF SHIPMENT
(In Gross Tons)

	December		12 Months Ended December	
	1927	1926	1927	1926
United Kingdom	2,741	40	21,139	92,083
British India	8,044	203	66,627	83,311
Germany	....	10,218	9,711	157,094
Netherlands	3,451	3,699	29,383	69,054
Canada	36	48	725	4,767
France	....	....	3,000	28,449
Belgium	....	....	699	7,488
All others	27	575	1,784	3,527
Total	14,299	14,783	133,068	445,773

Truscon Steel Co. to Build $350,000 Plant in Europe

YOUNGSTOWN, Jan. 31.—To take advantage of cheaper steel costs and cheaper labor in Europe, the Truscon Steel Co. has decided to build a European fabricating plant, which will likely be located in Belgium, President Julius Kahn announced this week, on his return from a European trip. The unit will be similar to the plant built by the company in 1927 at Los Angeles at an approximate cost of $350,000. The new plant will ship to Europe, Africa, China, Australia and India. It will be built this year.

At Youngstown, the company is extending its steel window and sash departments, wire mesh fabrication and metal lath plants, by 50 per cent at an estimated cost of $400,000. This work will be finished by May 1.

President Kahn states that the earnings in 1927 will show profits of 30 per cent on the company's common stock of $10 par value, against 38½ per cent in 1926. The annual meeting, scheduled for the second Tuesday in February, will be postponed 30 days.

The Illinois Steel Co. and the Inland Steel Co. have adopted new cards on extras for assembling and handling bars and small shapes. All specifications of less than 4000 lb. each of a size are subject to the following lump sum extras which will be added to the net price of the material: Less than 4000 lb. down to and including 2000 lb. take a lump sum extra of $4; less than 2000 lb. down to and including 1000 lb. take an $8 extra, and less than 1000 lb. takes a $12 extra. The old extras were $3, $6 and $10 respectively.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over	$33.00
Rerolling, under 4-in. to and including 1¾ in.	$33.50 to $34.00
Forging, ordinary	38.00 to 39.00
Forging, guaranteed	43.00 to 44.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$34.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.80c. to 1.85c.
Sheared	1.80c. to 1.85c.
Universal	1.80c. to 1.85c.

Wire Rods

	Per Gross Ton
*Common soft, base	$42.00 to $44.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $43 to $45. Cleveland mill base, $42 to $44.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria	10.00c.
Iron ore, Swedish, average 66% iron,	9.25c. to 9.50c.
Manganese ore, washed, 52% manganese, from the Caucasus	39c.
Manganese ore, Brazilian, African or Indian, basis 50%	38c. to 39c.
Tungsten ore, high grade, per unit, in 60% concentrates	$10.25 to $10.75

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.65 to $2.75
Foundry, f.o.b. Connellsville prompt	$3.75 to 4.50
Foundry, by-product, Ch'go ovens	9.00
Foundry, by-product, New England, del'd	11.50
Foundry, by-product, Newark or Jersey City, delivered	9.45 to 9.85
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis	9.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in., f.o.b. Pa. mines	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.10
Gas slack, f.o.b. W. Pa. mines	1.10 to 1.20

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd	$100.00
Foreign, 80%, Atlantic or Gulf port, duty paid	100.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $32.00
Domestic, 16 to 19%	29.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50 to $88.50
75%	130.00 to 140.00

	Per Gross Ton Furnace		*Per Gross Ton Furnace*
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		*Per Gross Ton*
6%	$23.00	10%	$28.00
7%	24.00	11%	30.00
8%	25.00	12%	32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd ..... 92c. to 95c.
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads ..... 11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace ..... $3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads $200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton $91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton $122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$14.50 to $15.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	First Quality	Second Quality
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	——
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagon	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled threads up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discount of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.75
F.o.b. Chicago	2.85

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened	80 and 10
Milled headless set screws, cut thread	80
Upset hex. head cap screws, U.S.S. thread	85 and 5
Upset hex. cap screws, S.A.E. thread	85 and 5
Upset set screws	80, 10 and 10
Milled studs	70 and 5

Chicago

Large Steel Sales and Specifications—Ingot Output at 88 Per Cent

CHICAGO, Jan. 31.—Immediate effects of recent price advances in plates, shapes and bars are sales that have been exceeded only twice in the last two years within a like period. These sales and an increase in specifications have made necessary an ingot output of 88 per cent of capacity. Another blast furnace has been lighted at Gary. This is the sixth steel works furnace that has been brought in since Jan. 1 and it makes the total count of active stacks 27 out of 36 in this district. Steel deliveries average about three weeks. Confidence among users is prompting them to make known their requirements farther in advance and this affords producers an opportunity to rearrange rolling schedules to accommodate the late comers or those who suddenly find their immediate needs have not been fully covered. At the same time producers hint at discouragement of small-lot orders by the announcement of an advance in extras for assembling and handling bars and small shapes. A better credit situation throughout most of the agricultural districts is reflected in orders for wire products. Nails, a dormant commodity until a week ago, are in good demand and stocks in producers' hands are low for this time of the year. Automobile plants are again stepping up production following a check in output during the first few days of the national automobile shows.

Pig Iron.—Shipments of foundry iron continue to grow heavier and it is of interest that malleable foundries are taking a larger share of local furnace output. Chicago producers are holding rigidly to $18.50 for deliveries in and near Chicago and to the North. Firmness in prices is lacking to the West and South. A central Indiana user closed for 1000 tons with a producer east of this district at a price that eliminated Chicago competition. Current sales are in good volume and for the most part represent a growing interest in second quarter requirements. Specifications for silvery iron are unusually large.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil. 1.75 to 2.25	$18.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	19.00
Malleable, not over 2.25 sil.	18.50
High phosphorus	18.50
Lake Superior charcoal, averaging sil. 1.50	27.04
Southern No. 2 fdy. (all rail)	22.01
Southern No. 2 (barge and rail)	20.18
Low phos., sil. 1 to 2 per cent, copper free	$28.50 to 29.00
Silvery, sil. 8 per cent	29.79
Bessemer ferrosilicon, 14 to 15 per cent	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Ferromanganese remains at $100, seaboard, though reports have been circulated that the price would be advanced $5 at once. Specifications for ferrosilicon are liberal. Spiegeleisen is bringing $32, base, Hazard, Pa., in the 19 to 21 per cent grade.

Prices delivered Chicago: 80 per cent ferromanganese, $107.56; 50 per cent ferrosilicon, $83.50 to $87.50; spiegeleisen, 19 to 21 per cent, $38.76 to $39.76.

Plates.—The Pennsylvania purchase of passenger cars is impressive in size, but it holds out little promise of steel tonnage for Western mills. In some quarters it is reported that about 150 of the coaches may be built in Western shops. An order for oil tanks has added 5000 tons to the books of a Western mill and definite inquiry has come out for 2000 tons of tank plates. This is the third successive week of fair specifications for car builders.

Mill prices on plates per lb.: 1.95c. to 2.05c., base, Chicago.

Structural Material.—Railroad requirements hold the center of attention in this market. The Santa Fe announces that its 1928 bridge program will require 20,000 tons of steel and the Northern Pacific will use 2000 tons. A railroad viaduct near Chicago calls for 1300 tons and a bridge for the Missouri-Kansas-Texas Lines will take 500 tons. The Garment Center Building, Chicago, taking 2400 tons, is said to have been awarded to the McClintic-Marshall Co. As a whole, the structural material market is active and gives promise of heavier shop operations before spring. Fabricators are making a stiff stand for better prices.

Mill prices on plain material per lb.: 1.95c. to 2.05c., base, Chicago.

Rails and Track Supplies.—A Western railroad has closed for 14,000 tons of standard-section rails. Fresh inquiry is developing slowly as the end of the rail buying movement is in sight. Business before Chicago mills, however, is not less than 75,000 tons. Orders for light rails are running ahead of the first month of last year, but the total business in this commodity is of small proportions. The railroads are now willing to take heavy shipments of track accessories and operations have been speeded to conform closely with rail output. Orders for track accessories totaled 25,000 tons. New inquiry is in small volume.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, $43; light rails, rolled from billets, $36. *Per Lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.25c.; angle bars, 2.75c.

Bars.—Recent advances in prices appear to have had the effect sought by producers in that sales in soft steel bars are unusually heavy, comparing favorably with the best weeks in many months. The demand is widespread and well balanced, with a widened circle of users. Judged by the demand for steel, the agricultural implement industry is in full swing. In some quarters a check was reported in the manufacture of automobiles, but it has had practically no effect on Chicago mills. The automotive industry is making a close study of its March requirements. An improvement is noted in the demand for iron bars, prices on which are steady at 1.90c., Chicago. Alloy bar mills are busy and deliveries are extended. Late in getting under way, the demand for rail steel bars is hitting a fair stride. Individual specifications are small but numerous, and they are causing mills no little trouble in maintaining reasonable rolling schedules, at the same time conforming to promised delivery dates. Backlogs are small and producers have been hesitant either to advance the price above 1.80c., Chicago Heights mills, or to increase mill operations more than a nominal amount.

Mill prices per lb.: Soft steel bars, 1.95c. to 2.05c., base, Chicago; common bar iron, 1.90c., base, Chicago; rail steel bars, 1.80c., base, Chicago Heights mill.

Sheets.—A widespread demand for sheets has necessitated an expansion in hot-mill operations, but specifications are at close range and producers can foretell operations only a week in advance. Deliveries are prompt, ranging 10 days to two weeks, depending on the product. Prices are steady under small scale buying.

Base prices per lb., delivered from mill in Chicago: No. 24 black, 3.05c.; No. 24 galvanized, 3.90c.; No. 10 blue annealed, 2.25c. to 2.35c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Cast Iron Pipe.—Fresh inquiry gives promise of an accurate check on prices in tonnage lots. Recent sales have been small at prices that range from $28 to $30, Birmingham. Springfield, Ohio, is taking bids on 4400 tons of 36-in. class B pipe, and Madison, Wis., will purchase 600 tons of 6 to 12-in. class B pipe. Other inquiry is for 400 tons by Rochester, Minn., and an unstated tonnage by Conneaut, Ohio. The American Cast Iron Pipe Co. is reported to be low bidder on 1000 tons of 6-in. to 24-in. centrifugal pipe at Minneapolis. Deliveries are a trifle easier, ranging from 20 to 30 days.

Prices per net ton, delivered Chicago: Water pipe, 6-in. and over, $34.20 to $36.20; 4-in., $38.20 to $40.20; Class A and gas pipe, $4 extra.

Wire Products.—Effective Jan. 25 the leading producer of wire and nails advanced quotations $2 a ton. Chicago delivered prices to jobbers in carload lots are now $2.70 on common nails and $2.55 on plain wire. Galvanized and cement coated nails and staples and spring, galvanized and barbed wire and plain fence wire were also advanced $2 a ton. No change was made on woven wire fencing or steel posts. It was announced

that the new prices were for acceptance on contracts for specification and delivery up to and including March 31. The last two weeks was marked by rapid strengthening in this market. The spring buying movement, which often does not get in full swing until February, has already grown to considerable proportions. Mill stocks were of fair size and well balanced early in January, but as the month comes to a close producers are depending on current output to fill orders and buyers are not getting the service in deliveries that they had become accustomed to in recent months. Mill output has been advanced to 67 per cent of capacity. Demand for wire products is widespread, being particularly good in the South and in the Middle States. Shipments of nails are heavy. Reports from the Northwest are more promising. Prices for wire products are given on page 353.

Wire Rods.—Local producers announce a price advance to $45, Chicago. New buying is in small volume, but specifications are liberal.

Hot-Rolled Strip.—Competition remains keen in this commodity and lower prices are the rule rather than the exception where desirable tonnages are at stake. Minimum prices for 6 in. and narrower are 2.20c., or occasionally a shade lower, and 2c. is not uncommon on wide strips. New buying is quiet, but specifications are of fair size.

Reinforcing Bars.—Shop operations have been reduced steadily and now do not average over 50 per cent of capacity. The outlook, however, is favorable. Projects that have been active remain so and each week finds a number of new developments in the hands of estimators. The Illinois State roadway program for 1928 is unusually large and already about 200 tons of rail steel bars has been placed for construction that will be begun in the early spring. Rail steel bar mills have revised price schedules on work of that kind and are now asking 1.85c. for slab reinforcement and 1.95c. for bars that go into culverts and bridges. Recent lettings and new projects are shown on page 369.

Coke.—Demand for by-product coke for foundry use is increasing. Prices are steady at $9, f.o.b. local ovens, and $9.50, delivered in the Chicago switching district.

Bolts, Nuts and Rivets.—A feature of this market is an advance in output to 70 per cent of capacity, following liberal releases by the automotive trade, manufacturers of farm implements and car builders. Railroad buying also is active. Large rivets are quoted at $2.85, Chicago, for immediate or future delivery.

Cold-Rolled Strip.—Sales of this commodity are small and afford no real test of price advances announced a week ago. The greater portion of large users and many small buyers had placed contracts at the old quotations. Specifications are liberal.

Old Material.—The Chicago scrap market is now displaying signs of strengthening. This is not a reflection of large consumer interest, but of miscellaneous inquiry by many buyers of small tonnage. With yards operating at reduced capacity, it is not always possible for dealers to cover short sales as rapidly as is their wish. The net result of this situation is that prices being paid by brokers have held close to a dead level for the past week and indications are at hand that higher prices may be paid in the near future. Railroad shipments are a trifle heavier. Dealers and consumers continue to bid against each other on lists and the general level of prices paid to railroads is on a par with two weeks ago when the market reached its highest point of interest and large consumer buying was active. In consequence the margins on recent orders are narrow. Active bidding for cast iron borings has advanced prices paid by dealers to $11 a gross ton. Offerings of rerolling rails by the railroads are large. The Santa Fe sold 1200 tons this week and tonnage of this grade on track is fully equal to the demands of local mills. Lists offered this week include 50,000 tons by the Pennsylvania; 4500 tons by the Burlington, and a blank list by the New York Central.

Prices delivered consumers' yards, Chicago:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$12.50 to	$13.00
Shoveling steel	12.50 to	13.00
Frogs, switches and guards, cut apart, and miscellaneous rails	14.25 to	14.75
Hydraulic compressed sheets	10.75 to	11.25
Drop forge flashings	9.75 to	10.25
Forged, cast and rolled steel carwheels	15.50 to	16.00
Railroad tires, charging box size	16.25 to	16.75
Railroad leaf springs, cut apart	16.25 to	16.75
Acid Open-Hearth Grades:		
Steel couplers and knuckles	14.50 to	15.00
Coil springs	16.50 to	17.00
Electric Furnace Grades:		
Axle turnings	13.00 to	13.50
Low phosphorus punchings	14.25 to	14.75
Low phosphorus plate, 12 in. and under	13.50 to	14.00
Blast Furnace Grades:		
Axle turnings	10.75 to	11.25
Cast iron borings	10.25 to	10.75
Short shoveling turnings	10.25 to	10.75
Machine shop turnings	7.50 to	8.00
Rolling Mill Grades:		
Iron rails	13.50 to	14.00
Rerolling rails	15.00 to	15.50
Cupola Grades:		
Steel rails less than 3 ft	15.25 to	15.75
Angle bars, steel	14.00 to	14.50
Cast iron carwheels	14.00 to	14.50
Malleable Grades:		
Railroad	13.75 to	14.25
Agricultural	12.50 to	13.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb	23.00 to	25.00
*Relaying rails, 65 lb. and heavier	26.00 to	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	14.00 to	14.50
Iron arch bars and transoms	18.75 to	19.25
Iron car axles	21.50 to	22.00
Steel car axles	16.00 to	16.50
No. 1 railroad wrought	11.00 to	11.50
No. 2 railroad wrought	11.00 to	11.50
No. 1 busheling	9.25 to	9.75
No. 2 busheling	4.25 to	4.75
Locomotive tires, smooth	12.50 to	13.00
Pipes and flues	8.00 to	8.50
Cupola Grades:		
No. 1 machinery cast	14.50 to	15.00
No. 1 railroad cast	13.50 to	14.00
No. 1 agricultural cast	13.50 to	14.00
Stove plate	12.00 to	12.50
Grate bars	11.50 to	12.00
Brake shoes	11.75 to	12.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24)	3.95c.
Galvanized sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.50c.
Spikes, standard railroad	3.55c.
Track bolts	4.55c.
Rivets, structural	3.60c.
Rivets, boiler	3.60c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, squares, tapped or blank	60
Hot-pressed nuts, hexagons, tapped or blank	60
No. 8 black annealed wire, per 100 lb	$3.20
Common wire nails, base per keg	$2.90 to 3.00
Cement coated nails, base per keg	2.90 to 3.00

Foundry Equipment Orders Higher

Based on reports from 16 companies, members of the Foundry Equipment Manufacturers' Association had net orders in December amounting to 106.2 per cent of the average monthly shipments of 1922-23-24. Shipments were at 110.4 per cent and unfilled orders represented 103.5 per cent of a month's average output. Orders were the highest since June, but considerably below the average of the first six months of 1927. In December, 1926, gross orders amounted to 181 per cent, compared with 106.8 per cent in the corresponding month of 1927.

The plant of the British-American Metals Co., manufacturer of brass and copper boiler tubing, Plainfield, N. J., was destroyed by fire on Jan. 29. It will be rebuilt.

New York

Large Inquiries for Steel Pipe—Pig Iron Demand Increasing

NEW YORK, Jan. 31.—Demand for pig iron is not only increasing, but there are evidences that some melters are preparing to make speculative purchases, believing that prices are headed upward. For example, a melter who has never bought more than 1000 tons at a time offers to pay cash for several times that tonnage for delivery as needed. Several buyers who have just recently placed orders are in the market for additional iron. The Thatcher Co., for instance, is asking for quotations on 1500 tons of No. 2 plain for its Garwood, N. J., plant and 1000 tons of No. 2X for its Newark, N. J., foundry for delivery during the remainder of this quarter. The Eastern Malleable Iron Co., Naugatuck, Conn., is inquiring for 2500 to 3000 tons of malleable. W. P. Laytham of W. P. Laytham & Sons Co. and the Eagle Iron & Brass Foundry, Inc., Passaic, N. J., is asking for prices on 3000 to 5000 tons of high silicon iron. The American Tube & Stamping Co. division of the Stanley Works, Bridgeport, Conn., is reported to have closed against an inquiry for 3000 to 5000 tons of basic. Total sales in this territory during the week are estimated at 8500 tons. Ruling quotations on Buffalo foundry iron remain at $17, base furnace, while eastern Pennsylvania foundry ranges from $19 to $19.50, base furnace.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$21.41 to $21.91
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.39 to 21.52
East. Pa. No. 2 fdy., sil. 2.25 to 2.75	20.89 to 22.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.39 to 22.52

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

Finished Iron and Steel.—A line pipe inquiry for 150,000 tons, an inquiry for 15,000 tons of pipe for export, a sale of 4000 tons of pipe for Ontario, Canada, and a rail order of 13,494 tons are among the outstanding developments of a more active steel market. Representatives of steel companies express satisfaction with the volume of incoming business, which, though largely in the form of specifications against contracts rather than new business, is of a more urgent character, indicating that buyers are influenced not only by their own expanding requirements but also by the extension of deliveries on some products. There is a good deal of room for improvement in the tonnage received by Eastern mills for plates and shapes, but the volume is slightly larger on these products as well as on bars. Sheets and strip steel are in good position from the mill point of view, and in some instances makers of sheets are not promising shipments in less than three or four weeks. Eastern mills have generally followed the advance of $1 a ton, quotations now being 2.14½c. on shapes and 2.17¼c. per lb. on plates, delivered New York. Bars are now 2.19c., New York. The Central Railroad of New Jersey has ordered from the Bethlehem Steel Co. 10,830 tons of 130-lb. and 2664 tons of 100-lb. rails.

Mill prices per lb., delivered New York: Soft steel bars, 2.19c.; plates, 2.17½c.; structural shapes, 2.14½c.; bar iron, 2.14c.

Reinforcing Bars.—The McClintic-Marshall Co. will furnish 500 tons of bars for a section of the subway in Manhattan, and Igoe Brothers will provide 250 tons for a warehouse at Garden City, N. Y. The volume of smaller jobs placed during the last week has been small. On Feb. 7 the mill price will be advanced $1 a ton to 1.95c. per lb., Pittsburgh. The Youngstown warehouse price is unchanged at 2.20c. or 2.57½c., on cars at New York. Out of New York warehouse the price is 2.80c. for lots of 5 tons or more, 2.95c. for lots of 2 to 5 tons and 3.24c. for less than 2 tons, all delivered at job.

Warehouse Business.—Orders are smaller and less numerous than earlier in the month. Effective Jan. 25, black and galvanized sheets have been reduced to 4c. per lb., base, for black and 4.70c. per lb., base, for galvanized. New Jersey jobbers are still quoting 4.20c. per lb., base, for black and 4.95c. per lb., base, for galvanized.

Cast Iron Pipe.—Yonkers, N. Y., has purchased about 370 tons of 6 and 8-in. water pipe and some export business has been booked, including a small tonnage for a private user in Cuba and about 2000 tons for Manila, P. I. Bids on about 8000 tons of cast iron pipe for Camaguey and Santiago, Cuba, recently reported placed with the French maker, are understood to have been rejected and a new inquiry will be issued. Prices are fairly firm, but show no tendency to advance.

Prices per net ton, delivered New York: Water pipe 6-in. and larger, $37.25 to $38.25; 4-in. and 5-in., $42.25 to $43.25; 3-in., $52.25 to $53.25; Class A and gas pipe, $4 to $5 extra.

Coke.—Demand is small and prices are unchanged at $4 per net ton, Connellsville, for foundry grade and $2.75 to $3 per ton, Connellsville, for furnace coke. Delivered prices are: To northern New Jersey, $8.03;

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.30c.
Flats and squares	3.80c.
Cold-rolled strip, soft and quarter hard,	6.00c. to 6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage),	3.84c. to 3.89c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

Machine bolts, cut thread:	Per Cent Off List
¾ x 6 in. and smaller	55 to 60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	55 to 60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	55 to 60
1 x 16 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in	$17.33
Seamless steel, 2-in	20.24
Charcoal iron, 2-in	25.00
Charcoal iron, 4-in	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	5	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.10	$5.85
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c. to 4.00c.
No. 22	3.95c. to 4.15c.
No. 24	4.00c. to 4.20c.
No. 26	4.10c. to 4.30c.
No. 28*	4.25c. to 4.45c.
No. 30	4.50c. to 4.70c.

Sheets, Galvanized

	Per Lb.
No. 14	4.35c.
No. 16	4.45c.
No. 18	4.35c. to 4.60c.
No. 20	4.50c. to 4.75c.
No. 22	4.55c. to 4.80c.
No. 24	4.70c. to 4.95c.
No. 26	4.95c. to 5.20c.
No. 28*	5.20c. to 5.45c.
No. 30	5.60c. to 5.85c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

to New York or Brooklyn, $8.79; to Newark or Jersey City, $7.91. By-product coke continues at $9 to $9.40 per net ton, delivered Newark or Jersey City.

Old Material.—Prices of all grades are substantially unchanged. Business is confined to small transactions and shipments on old contracts. Some export business is in prospect if prices offered by foreign buyers are increased slightly. Japanese exporters have been purchasing old rails and are still in the market for No. 1 heavy melting steel, while agents of German mills have been inquiring for No. 1 heavy melting steel. Machine shop turnings are being purchased at $10.75 to $11 per ton, delivered eastern Pennsylvania. Stove plate is quoted at $12.50 per ton, delivered.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel	$10.00 to $10.85
Heavy melting steel (yard)	6.75 to 7.25
No. 1 heavy breakable cast	11.25 to 12.00
Stove plate (steel works)	8.75 to 9.00
Locomotive grate bars	8.75 to 9.00
Machine shop turnings	6.75 to 7.50
Short shoveling turnings	7.00 to 7.50
Cast borings (blast furnace or steel works)	6.75 to 7.50
Mixed borings and turnings	7.00 to 7.50
Steel car axles	16.00 to 16.50
Iron car axles	23.75 to 24.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.75
Forge fire	6.50 to 7.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought, long	9.00 to 9.50
Rails for rolling	10.50 to 11.00
Cast iron carwheels	11.25 to 11.75
Stove plate (foundry)	8.75 to 9.00
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.00 to 11.50

Prices per gross ton, delivered local foundries:

No. 1 machinery cast	$13.50 to $14.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	11.50 to 12.00
No. 2 cast (radiators, cast boilers, etc.)	11.00 to 11.50

Cleveland

January Steel Business Larger Than December's for Some Mills

CLEVELAND, Jan. 31.—January has made a very good showing in the volume of finished steel business, which with some mills was larger than during December, when specifications for January shipment were heavy. The volume of business with a number of the mills during the closing week of the month did not hold up to that earlier in the month. This statement applies to sheets and strip steel as well as to the heavier forms of finished steel. Consumers specified heavily early in the month and many have not yet felt the need of issuing additional specifications.

The automotive industry is under good operation, although not going at capacity. As automobile manufacturers and parts makers generally are under contract for the first quarter, very little new business is coming from this source.

Structural inquiry has fallen off. The advance to 1.85c., Pittsburgh, on steel bars, plates and structural material is being adhered to. Few sales have been made at the advance, as most buyers covered at 1.80c., Pittsburgh. Local mills quote steel bars at 1.85c., Cleveland. A Cleveland plate mill has followed the advance to 1.85c., Pittsburgh.

The award of 57,800 tons of structural steel by the Cleveland Union Terminals Co., a New York Central Railroad interest, reported last week, for various construction work in connection with the Cleveland Union Depot project, about completes, for the present at least, the buying of structural steel for this project. However, the laying of new tracks is expected to require considerable steel for grade elimination work, but this steel may not be bought until next year. The total amount of structural steel purchased for this project, including the 57-story Terminal Tower Building, one section of which is now completed and occupied, the station proper, several viaducts, a lift bridge, a railroad bridge across the Cuyahoga River and valley and several commercial buildings, is approximately 108,000 tons. Of this, various contracts placed with the American Bridge Co. aggregate 95,800 tons. The Mount Vernon Bridge Co. has taken 10,200 tons and the McClintic-Marshall Co. 2000 tons.

Pig Iron.—Sales by Cleveland interests amounted to 24,000 tons the past week, or a gain of 5000 tons over the previous week. Furnaces took many small orders from consumers who are following a hand-to-mouth policy in buying. Not much business has been booked for the second quarter and sales for that delivery are expected to fall below those for the first quarter, as considerable fourth quarter iron was carried over to this quarter and many consumers will carry over first quarter iron to the second quarter. Most producers shipped in January as much iron as they made, but some producers still have fairly large stock piles. Some furnaces shipped more iron during January than during the corresponding month last year and others about the same amount. Shipments to the automotive industry in the Michigan territory continue heavy. Prices are unchanged. Producers are willing to take second quarter business at current prices. A Muncie, Ind., foundry placed 2000 tons of malleable iron for the second quarter, dividing it among four furnaces at a delivered price equivalent to a $17 Lake furnace price, although a Cleveland producer had to shade its price to $16.50 to overcome a 50c. freight disadvantage. For delivery in the territory adjacent to Cleveland $17 is being maintained. Furnaces are holding quite generally to $18 for foundry and malleable grades for Michigan delivery, but $17.50 has not disappeared. Sales include 500 tons of basic iron by a Lake furnace to a north central Ohio steel foundry.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$18.50
Southern fdy., sil. 1.75 to 2.25	22.00
Malleable	18.50
Ohio silvery, 8 per cent	28.00
Basic, Valley furnace	17.00
Standard low phos., Valley furnace	$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—A $2 a ton price advance to $44, Cleveland, has been made on wire rods for the remainder of the first quarter. Many consumers covered at $40 before the last price advance. Sheet bars, slabs and billets are unchanged at $33, Cleveland. Specifications are good.

Sheets.—While a fair amount of new business is coming out, mills are depending largely on specifications received earlier in the month to keep them operating at close to capacity. Outside of the automotive field the demand is only moderate. A few inquiries are coming out for March shipment. While most leading manufacturers are holding to regular prices, concessions of $2 a ton from these prices have not disappeared, or 2.80c., Pittsburgh, on black sheets in common grades and 2c. on blue annealed. Galvanized sheets are unchanged at 3.65c., Pittsburgh. A Cleveland producer has advanced auto body sheets to 4.15c., but others are still on a 4c. base.

Strip Steel.—Some makers have followed the advance on cold-rolled strip steel of $3 a ton, now quoting 2.90c., Cleveland, for 3 tons or over, and 3.15c. for 1 to 3 tons, but 2.75c. and 3c. have not disappeared. Fender stock is irregular, ranging from 4.15c. to 4.20c., Cleveland. Specifications are good but there is little new business, as nearly all consumers are under contract for the quarter. Hot-rolled strip is firm at 1.85c., Cleveland, for material 6 in. to 12 in. wide, and at 2.05c. for narrower than 6 in. Most shipments on contract are being made at lower prices.

Wire Products.—A price advance of $2 a ton on nails and wire has been announced by all the leading pro-

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	3.00c.
Reinforcing steel bars	2.25c. to 2.75c.
Cold-finished rounds and hexagons	3.65c.
Cold-finished flats and squares	4.15c.
Hoops and bands	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.75c.
Galvanized sheets (No. 24)	4.40c. to 4.50c.
Blue annealed sheets (No. 10)	3.25c.
No. 9 annealed wire, per 100 lb	$2.90
No. 9 galvanized wire, per 100 lb	3.35
Common wire nails, base per keg	3.90

*Net base, including boxing and cutting to length.

ducers to apply on business taken during the remainder of the first quarter. New prices are $2.65 per keg, Cleveland, for nails and $2.50 per 100 lb. for plain wire. Before the advance, buyers not fully covered for the quarter were allowed to place supplemental orders and consequently little business will be taken for the current quarter at the higher prices.

Reinforcing Bars.—Awards include 1600 tons for a factory building in Toledo. Work in connection with the Cleveland Union Terminals project will require 2000 tons in addition to 1600 tons still pending. Local warehouse prices are irregular. Rail steel bars are unchanged at 1.65c., mill.

Warehouse Business.—Sales show a fair gain. Prices are being firmly maintained and there is talk of an advance on sheets.

Coke.—Cold weather has stimulated the demand for by-product coke for domestic use. The price is unchanged at $4.50, Ohio ovens. Heating coke is moving slowly, with $2.75 the ruling price at Connellsville for early shipment. Connellsvile foundry coke is unchanged at $3.75 to $5.10, ovens.

Bolts, Nuts and Rivets.—Demand for bolts and nuts is fair, holding to the gain reported earlier in the month. Rivet specifications, which have been light, improved somewhat during the week. Little new business is coming out for either product, as buyers generally are under contract. Prices are firm.

Old Material.—Demand is limited to small-lot purchases by dealers to cover old orders. Prices are no lower except on No. 1 busheling. Plenty of scrap is coming out at ruling quotations and some of the mills are not taking material as freely as early in the month, shipments having been received faster than needed. Small-lot purchases were made by local dealers during the week at $14 and $13.50 for Nos. 1 and 2 heavy melting steel and at $10.50 for blast furnace scrap. No. 1 busheling scrap has declined to around $11, Cleveland, reflecting the weak market on this grade in Detroit.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$13.75 to $14.00
No. 2 heavy melting steel	13.25 to 13.50
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	11.50 to 11.75
Drop forge flashings	12.50 to 13.00
Machine shop turnings	9.00 to 9.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	11.00 to 11.25
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops	16.50 to 17.00
Low phosphorus, billet, bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops	16.50 to 17.00
Low phosphorus plate scrap	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings	10.50 to 10.75
Mixed borings and short turnings	10.50 to 10.75
No. 2 busheling	10.50 to 10.75
Cupola Grades	
No. 1 cast	16.50 to 17.00
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.00 to 15.50
Rails for rolling	16.25 to 16.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c. to 2.60c.
Plates, ⅜-in.	2.80c. to 3.00c.
Structural shapes	2.40c. to 2.60c.
Soft steel bars, small shapes and iron bars (except bands)	2.40c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforcing steel bars, square, twisted and deformed	2.50c. to 3.00c.
Cold-finished steel, rounds and hexagons	3.25c. to 5.25c.
Cold-finished steel, squares and flats	3.75c. to 5.75c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅛-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24)	4.25c.
Galvanized sheets (No. 24)	5.10c.
Blue annealed sheets (No. 10)	3.15c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

Philadelphia

New Steel Orders Small—Eastern Mills Quoting on New Price Bases

PHILADELPHIA, Jan. 31.—Mills are receiving a steady flow of specifications against contracts for plates, shapes and bars, but purchasing at the new price levels is limited to occasional small tonnages, most consumers having covered their requirements for the present quarter. Plates and bars are firm, but there is still irregularity in shape prices because of hang-over projects. On new business all eastern Pennsylvania mills are now quoting on the advanced basis.

Pig iron is quiet and the only test of $19.50 per ton, base, on foundry iron has been in purchases of carload lots or a few hundred tons. With most mills carrying fair stocks of scrap on their yards, the old material market continues quiet. The list of the Pennsylvania Railroad, bids on which open Feb. 1, offers close to 45,000 tons of scrap.

Iron and steel warehouses in this district have adopted a list of quantity extras on iron and steel bars and small shapes.

Pig Iron.—Consumers of foundry iron are fairly well covered so that present purchasing is only of occasional carload lots, on which the price of $19.50 per ton, base, is apparently quite firm. There is some inquiry in the market for malleable iron, including a small tonnage for a Baltimore foundry. Small sales of low phosphorus iron continue. Importers of British low phosphorus report that their prices have been advanced about 50c. a ton to $23.50 to $24 per ton, duty paid, Atlantic port. No sales of basic are reported.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$20.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	20.76
East. Pa. No. 1X	21.26
Basic (delivered eastern Pa.)	$19.50 to 20.00
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Standard low phos. (f.o.b. New York State furnace)	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	24.54 to 25.04
Virginia No. 2X, 2.25 to 2.75 sil.	25.04 to 25.54

Prices, except as specified otherwise, are delivered Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Mills are maintaining the new basis of 1.85c. per lb., base, Pittsburgh, or 2.17c. per lb., Philadelphia, but activity is principally in specifications against existing contracts at the former schedule.

Shapes.—All eastern Pennsylvania mills have advanced to the new level of 1.85c. per lb., Pittsburgh, 2c. per lb., Bethlehem, 1.97½c. per lb., Pottsville, or 2.12c. to 2.13c. per lb., delivered Philadelphia. With contracts at lower prices still in existence, occasional shading still appears. An obstacle to greater firmness is the fabricated material market, bids in which have not yet reflected the upward movement in shapes. In addition to sizable bridge contracts, local fabricators have in prospect the projected Fox theater and office building for Seventeenth and Market Streets, estimated to cost $11,000,000.

Plates.—Prices are being quoted at 2c. per lb., Coatesville, or 2.10c. per lb., delivered Philadelphia, and all eastern Pennsylvania producers are now on the new basis. Specifications against contracts are liberal, but new business is limited.

Sheets.—Blue annealed sheet prices are steady at 2.10c. per lb., base, with widths greater than 40 in. taking a 10c. per 100-lb. extra. Both black and galvanized sheets, however, still exhibit occasional weakness. A motor company is reported to have obtained a concession on black sheets; galvanized sheets also have been slightly shaded.

Warehouse Business.—Demand for material from warehouse stocks is small. A list of quantity extras adopted by the warehouses selling iron and steel bars and small shapes applies the base price to orders for 2000 lb. or more. For 1500 to 1999 tons the extra is

13c. per 100 lb.; for 1000 to 1499 tons, the extra is 30c. per 100 lb. and for less than 1000 lb. the extra is 50c. per 100 lb. Iron and steel bars are being quoted at 2.40c. per lb., base, and shapes at 2.40c. to 2.60c. per lb.

Ferromanganese.—Quotations continue unchanged at $100 per ton, seaboard. Both British and domestic sellers are inclined to discount recent reports that a small advance in price was contemplated.

Imports.—In the week ended Jan. 28, a total of 696 tons of pig iron was received at this port from India. Steel arrivals included 339 tons of structural shapes and 8 tons of steel bars from Belgium; from France, 42 tons of steel billets, 24 tons of bars and 22 tons of structural shapes and 35 tons of hoops and bands; from the United Kingdom, 6 tons of hoops and bands.

Old Material.—Prices of all grades are unchanged. One eastern Pennsylvania consumer with sufficient tonnage of stove plate, machine shop turnings and yard steel is offering to make further purchases at 50c. less than was recently paid, but no transactions are reported at the lower level. The list of the Pennsylvania Railroad, bids on which open Feb. 1, offers close to 45,000 tons of iron and steel scrap.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$13.50 to $14.00
Scrap T rails	13.00 to 13.50
No. 2 heavy melting steel	11.00 to 11.50
No. 1 railroad wrought	15.25 to 15.75
Bundled sheets (for steel works)	10.50 to 11.00
Machine shop turnings (for steel works)	11.00
Heavy axle turnings (or equivalent)	12.00 to 12.50
Cast boring (for steel works and rolling mill)	11.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	13.00
Stove plate (for steel works)	13.00
No. 1 low phos., heavy, 0.04 per cent and under	18.00 to 18.50
Couplers and knuckles	16.00 to 16.50
Rolled steel wheels	15.50 to 16.00
No. 1 blast furnace scrap	10.00 to 10.50
Machine shop turnings (for rolling mill)	11.00 to 11.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.00 to 13.50
Shafting	17.50 to 18.00
Steel axles	19.00 to 20.00
No. 1 forge fire	11.00 to 12.00
Steel rails for rolling	15.00 to 15.50
Cast iron carwheels	15.50 to 16.50
No. 1 cast	16.00 to 16.50
Cast borings (for chemical plant)	15.00 to 15.50

Steel Corporation Fails to Earn Common Dividend

Fourth Quarter Earnings Lowest Since Last Quarter of 1924— Bethlehem Profits Also Show Decrease

EARNINGS of the United States Steel Corporation for the last quarter of 1927 were $31,247,529, roughly $10,000,000 less than in the preceding quarter, and the lowest since the fourth quarter of 1924, when earnings of $30,939,912 were shown. In the corresponding quarter of 1926 the corporation earned $53,502,525.

In terms of the present common stock issue of 7,116,235 shares, earnings in the past quarter, after payment of preferred stock dividend, amounted to $1.05 per share, and for the first time since the third quarter of 1924 common dividend requirements were not met. Additional common stock recently issued does not account for this fact as the deficit for the quarter ended Dec. 31, 1927, was $4,963,499, or considerably higher than the additional dividend requirements necessitated by the common stock increase.

Based upon quarterly statements for the year, the indicated surplus available for common and preferred dividends, after all other charges, is $87,845,456. This compares with $116,667,404 in 1926 and with $90,602,653 in 1925. After dividend requirements which were declared for the present quarter at the usual rate of 7 per cent yearly, balance to surplus for 1927 amounted to $12,812,134. In 1926, $25,783,238 was added to surplus after an appropriation of $30,000,000 for improvements and additions to plants and property.

The following table shows earnings in recent years by quarters:

Quarters	1927	1926	1925	1924
First	$45,584,725	$45,061,285	$39,882,992	$50,075,445
Second	46,040,460	47,814,105	40,624,220	41,381,039
Third	41,373,831	52,626,826	42,400,419	30,718,415
Fourth	31,247,529	53,502,525	42,630,840	30,939,912

Bethlehem Earnings Also Show Decrease

The Bethlehem Steel Corporation also showed a decrease in earnings for 1927, its net income amounting to $15,826,142 or $5.02 per share of common stock, as compared with $20,246,167 or $7.48 a share in 1926. In the past quarter Bethlehem profits were $2,371,371, equivalent to 37c. per share on the common stock. This compares with $2,788,053 or 61c. a share in the preceding quarter, and with $4,481,316 or $1.55 a share in the fourth quarter of 1926.

Earnings of Other Companies

The Crucible Steel Co. of America had net earnings in 1927 of $5,617,145, compared with $6,547,731 in 1926. The Gulf States Steel Co. earned $756,402 in 1927, as compared with $799,792 in the preceding year. This company's earnings in the fourth quarter of 1927 were $234,994, compared with $150,182 in the preceding quarter, and with $234,852 in the fourth quarter of 1926.

The Superior Steel Corporation reported a deficit for 1927 of $189,847, compared with net profits of $271,817 in 1926. The deficit in the fourth quarter of 1927 was $73,223, compared with $32,608 in the preceding quarter and with profits of $5,712 in the last quarter of 1926. The Virginia Iron, Coal & Coke Co. also had a deficit in 1927, which amounted to $170,291, compared with net profits of $84,022 in the preceding year.

EARNINGS FOR FOURTH QUARTER OF THE UNITED STATES STEEL CORPORATION

	Earnings Before Charging Interest on the Subsidiary Companies' Bonds Outstanding	Less: Interest on the Subsidiary Companies' Bonds Outstanding	Balance of Earnings
Oct., 1927	$12,526,787	$657,317	$11,869,470
Nov., 1927	10,281,777	656,845	9,624,932
Dec., 1927	10,408,428	655,301	9,753,127
	$33,216,992	$1,969,463	
Total earnings after deducting all expenses incident to operations, also estimated taxes and interest on bonds of the subsidiary companies			$31,247,529
Less, charges and allowances for depletion and depreciation, applied as follows, viz.:			
To depletion and depreciation and sinking funds on bonds of subsidiary companies		$10,623,859	
To sinking funds on United States Steel Corporation bonds		2,940,068	
			13,563,927
Net income			$17,683,602
Deduct: Interest for the quarter on United States Steel Corporation bonds outstanding		$4,115,658	
Premium on bonds redeemed		323,969	
			4,439,627
Balance			$13,243,975
Add: Net balance of sundry receipts and charges, including adjustments			550,858
Total			$13,794,833
Dividends:			
Preferred, 1¾ per cent		$6,304,920	
Common, 1¾ per cent		12,453,412	
			18,758,332
Deficit for the quarter			$4,963,499
Balance of surplus for nine months ended Sept. 30			17,775,633
Balance of surplus for the year			$12,812,134

Birmingham

New Steel Tonnage Developing at a Satisfactory Rate

BIRMINGHAM, Jan. 31.—Only a small amount of new iron tonnage is coming in. Birmingham furnaces continue to quote foundry iron on a $16 base. The Woodward Iron Co. changed its basic furnace back to foundry on Jan. 25 and is now operating these on foundry. Seventeen furnaces are in blast in Alabama, 10 on foundry, six on basic and one on recarburizing iron. It is expected that the Tennessee company will place a Bessemer furnace in blast within a short time. All but the six Ensley furnaces of the Tennessee company are now idle.

Prices per gross ton. f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil	$16.00
No. 1 foundry, 2.25 to 2.75 sil	16.50
Basic	15.00

Finished Steel.—New tonnage is developing at a satisfactory rate and the market has a firmer tone. Business lately has been encouraging and prospects for the next several months are good. The Tennessee Coal, Iron & Railroad Co. has been gradually increasing open-hearth production at its Ensley works and now is operating eight and nine. At the Fairfield works the number is unchanged at four. The Gulf States Steel Co. continues with four. Structural steel fabricators report little change in market or operations.

Cast Iron Pipe.—Tonnage is pending from two cities in Florida and one in North Carolina. Minneapolis and New York each placed around 1000 tons with Birmingham plants. All pressure pipe producers report that small business is accumulating at a steady rate. Market conditions have improved during the past 10 days.

Coke.—Moving in fairly good volume. Price remains at $5.

Old Material.—Business is somewhat improved and inquiries are increasing. Prices are unchanged.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel	$9.50 to $10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	8.00 to 8.50
Cast iron borings	8.00 to 8.50
Stove plate	13.00 to 14.00
Steel axles	19.00 to 20.00
Iron axles	20.00 to 21.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	13.00
No. 1 cast	15.00
Tramcar wheels	12.50 to 13.50
Cast iron carwheels	12.00 to 13.00
Cast iron borings, chemical	13.50 to 14.00

Youngstown

Sheet Makers Taking Stronger Stand on Prices

YOUNGSTOWN, Jan. 31.—Steel business has been going on as usual, despite the fact that the mergers involving companies in this district have been getting the attention of the executives and have been the principal topics of trade discussions. Steel manufacturers report a considerable improvement in sales, production and shipments as compared with the closing months of last year and they are hopeful for the future. The automotive industry, which means so much to the district on account of the preponderance of sheet-making capacity, is not yet buying freely and there is the expectation that as automobile production moves upward, steel requirements must expand very substantially. No complaint is heard as to the movement of bars and small shapes, which are firmly held at the new base of 1.85c., Pittsburgh, on new business and on which it is commonly believed still higher prices will be reached on second quarter contracts. Mills are beginning to take a stronger stand on sheet prices, and while competition and the fact that buyers were covered pretty heavily for this quarter at lower prices makes impossible getting the full first quarter prices, it seems to be the intention of makers to get 2.90c., base, Pittsburgh, 3.75c., base, and 2.10c., base, respectively, for black, galvanized and blue annealed sheets on second quarter business.

Good specifications are coming to the tin plate mills in the district, which now have orders sufficient to sustain an operation of slightly over 75 per cent of capacity. Output of this product in this district will be materially increased by changes that are to be made in the operation of the Trumbull works, where through partial use of the continuous strip mill for breaking down slabs it is planned to double the present output of the Trumbull and Liberty mills, which now have a rated annual capacity of 2,500,000 base boxes.

There is a seasonal increase in the demand for standard weight pipe, and the leading producer still has a good order book in line pipe, but the general average is kept down by the continued lack of activity in oil country goods. An effort is being made to extend the curtailment of oil production in the Seminole, Okla., field for another three months with the expiration of the present agreement on March 31. If this move is successful it probably will mean drilling operations in other fields and a demand for well pipe, but failure would mean the release of so much oil now capped that the effect would be fresh weakness in oil prices and little or no drilling elsewhere. Line pipe promises to be the backbone of pipe business next spring and summer as the lines now pending amount to no less than 2000 miles, for which 200,000 tons is probably a conservative estimate, since much of the pipe is of large outside diameter.

Semi-finished steel is not moving with much snap at present, but this is explained by the fact that sheet bars constitute most of such business and the principal buyers are the companies that have been combined in the Empire Steel Corporation. The working out of details of that merger have engaged those interested to the exclusion of other matters. Sheet bar makers still call the market $34, mill, or $34.50, delivered Youngstown district.

Pig iron is not doing much. Weakness in the Pittsburgh market has had the effect of restricting local purchases of scrap.

Steel works operations in the so-called Youngstown district are running from 70 to 75 per cent of capacity. Since the first of the month the Carnegie Steel Co. has put on three blast furnaces, two Ohio and one Farrell, while last week Republic Iron & Steel Co. started up its No. 4 furnace at Hazleton. The latter has written off its No. 1 furnace and now has only four workable stacks. Through improvement in equipment and in practice, these four furnaces are producing as much iron as formerly was obtained from five, while the No. 2 stack, rated at 600 tons a day, has been averaging more than 800 tons daily during the past three months and has on several days gone over 900 tons.

With the absorption of Trumbull Steel Co. by Republic Iron & Steel Co., the name of the former will disappear and the plant at Warren, Ohio, will be known as the Trumbull or Warren works of the Republic company. A number of Trumbull men now located at Warren will come to Youngstown. The new personnel of the combined companies will be announced within the next two weeks.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
Black sheets (No. 24)	4.45c.
Galvanized sheets (No. 24)	5.25c.
Blue annealed sheets (No. 10)	3.60c.
Black corrugated sheets (No. 24)	4.50c.
Galvanized corrugated sheets	5.30c.
Structural rivets	3.75c.
Boiler rivets	3.75c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	70
Less than 100 lb	65
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, square, blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hexagons, blank or tapped, 200 lb. or more	60
Less than 200 lb	50

St. Louis

Steel Business at Greatly Improved Rate—Pig Iron Melt Increasing

ST. LOUIS, Jan. 31.—Shipments of pig iron are being well maintained, but sales are light. Of the sales by the Granite City maker, 500 tons went to a district user of malleable, 750 tons of foundry grades went to a central Illinois melter, 400 tons of foundry to a St. Louis consumer and 250 tons of this grade to a Kansas City melter. Most of the sales were for first quarter shipment.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$19.50 to $20.00
Northern No. 2 fdy., delivered St. Louis	20.66
Southern No. 2 fdy., delivered	20.42
Northern malleable, delivered	20.66
Northern basic, delivered	20.66

Freight rates: 81c. from Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Coke.—Because of the increase in pig iron melt, there has been a better demand for metallurgical coke, and shipments are holding up well. The trade in domestic grades is slow.

Finished Iron and Steel.—The Granite City mill reports that since Jan. 1 business has been coming in better than at any time during the last five months; that its production of ingots is about 85 per cent of capacity. Its sheet and tin mills are operating at full capacity and its plate operations are at 65 per cent of capacity. Warehouse business is quiet, although there is an improvement over December sales. Structural fabricators' business is still very light.

Old Material.—Heavy offerings by railroads and country dealers which weakened the market a week or so ago have been absorbed and prices are steadier. The only change this week is a decline of 50c. a ton on railroad springs. There has been some buying of melting steel and stove plate. Railroad lists include: Pennsylvania, 40,000 tons; Chicago, Burlington & Quincy, 4500 tons; Union Pacific, 2000 tons; Big Four, 1960 tons; New Orleans & Great Northern, 230 tons; Standard Oil of Indiana, 125 tons; Missouri Pacific, 120 cars; Chicago, Milwaukee & St. Paul, 40 carloads, and Mobile & Ohio, 32 carloads.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel	$12.50 to $13.00
No. 1 locomotive tires	14.00 to 14.50
Heavy shoveling steel	12.50 to 13.00
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart	14.25 to 14.75
Railroad springs	14.50 to 15.00
Bundled sheets	9.00 to 9.50
No. 2 railroad wrought	12.50 to 13.00
No. 1 busheling	10.50 to 11.00
Cast iron borings	9.25 to 9.75
Iron rails	14.00 to 14.50
Rails for rolling	15.25 to 15.75
Machine shop turnings	8.00 to 8.50
Steel car axles	20.00 to 20.50
Iron car axles	24.00 to 24.50
Wrought iron bars and transoms	21.00 to 21.50
No. 1 railroad wrought	11.50 to 12.00
Steel rails, less than 3 ft.	15.75 to 16.25
Steel angle bars	14.00 to 14.50
Cast iron carwheels	14.25 to 14.75
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	12.50 to 13.00
No. 1 railroad cast	14.00 to 14.50
Stove plate	13.75 to 14.25
Agricultural malleable	12.50 to 13.00
Relaying rails, 60 lb. and under	20.50 to 23.50
Relaying rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel	5.85c.
Black sheets (No. 24)	4.30c.
Galvanized sheets (No. 24)	5.15c.
Blue annealed sheets (No. 10)	3.80c.
Common wire nails, base per keg	$3.65
Black wire, base per 100 lb	3.90

Buffalo

Inquiry for 2500 Tons of Malleable—Steel Operations Increase

BUFFALO, Jan. 31.—The principal pig iron inquiry is from Eastern Malleable Co., Naugatuck, Conn., for 2500 to 3000 tons of malleable. The New York Air Brake Co. is in the market for 400 to 500 tons of malleable, following its recent purchase of 1000 tons of the same grade for its Watertown, N. Y., plant. While malleable has been held at $17.50, this price has lately been shaded on sizable business and better than $17 has been done by a buyer outside the Buffalo district. On foundry iron $17 is being shaded on eastern shipment, though holding firmly in this district. Some miscellaneous small inquiry is coming out and shipments are said to have increased. The Donner Steel Co., which banked a furnace recently, has the stack back in blast. The Hanna Furnace Co. has blown out one of its two stacks on Hamburg Street.

Prices per gross ton, f.o.b. furnace:

No. 2 plain fdy., sil. 1.75 to 2.25	$17.00
No. 2X foundry, sil. 2.25 to 2.75	17.50
No. 1X foundry, sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	$17.00 to 17.50
Basic	17.00
Lake Superior charcoal	27.28

Finished Iron and Steel.—Good specifications are reported by sheet makers, automobile business being particularly active. Black sheets are firm, with more business being placed at 2.90c. Automobile body sheets are firm at 4c., and some business has been taken at 4.10c. Sheet mill operations are at 85 per cent. Improved mill operation is reported. The Donner Steel Co. has increased its active open-hearth furnaces to six and Bethlehem's Lackawanna plant has been operating 21 out of 24 open-hearths for some time. Demand for bars, shapes and plates is fair. Heavier buying of bolts and nuts is reported.

Old Material.—There has been some buying of heavy melting steel, including a 3000-ton transaction. A Buffalo consumer paid between $15.25 and $15.50 for this tonnage. Some inquiries have come out for low phosphorus billet and bloom ends, but no large tonnages have been sold. An offer of $10.75 is being made by a local consumer for short mixed turnings and borings; another consumer at a point taking a 63c. freight rate from Buffalo offered $11 for this material when last in the market. Short shoveling steel turnings for electric and blast furnaces have advanced to $11 to $11.50. A sale of steel rails, 3 ft. and under, at $17 to $17.25, is recorded.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	13.50 to 14.00
Scrap rails	13.75 to 14.25
Hydraulic compressed sheets	13.50 to 14.00
Hand bundled sheets	9.00 to 9.50
Drop forge flashings	11.50 to 12.00
No. 1 busheling	13.50 to 14.00
Heavy steel axle turnings	12.75 to 13.25
Machine shop turnings	9.00 to 9.25
Acid Open-Hearth Grades	
Railroad knuckles and couplers	16.00 to 16.50
Railroad coil and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phosphorus billet and bloom ends	15.75 to 16.00
Electric Furnace Grades	
Heavy steel axle turnings	12.75 to 13.25
Short shoveling steel turnings	11.00 to 11.50
Blast Furnace Grades	
Short shoveling steel turnings	10.75 to 11.00
Short mixed borings and turnings	10.50 to 11.00
Cast iron borings	10.50 to 11.00
No. 2 busheling	9.00 to 9.50
Rolling Mill Grades	
Steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.50 to 13.00
Cupola Grades	
No. 1 machinery cast	14.50 to 15.00
Stove plate	13.00 to 13.25
Locomotive grate bars	10.50 to 11.00
Steel rails, 3 ft. and under	17.00 to 17.25
Cast iron carwheels	13.00 to 13.50
Malleable Grades	
Railroad	15.00 to 15.50
Agricultural	15.00 to 15.50
Industrial	15.00 to 15.50

Canada

Iron and Steel Industries Report Improved Business

TORONTO, ONT., Jan. 31.—Improvement continues to feature business in the iron and steel industries of Canada. Makers of railroad rolling stock equipment have recently closed large orders and other business of a like nature is pending. Rail mills are operating at capacity on orders closed late in 1927, and it is stated that both the Algoma Steel Corporation, Sault Ste. Marie, Ont., and the Dominion Iron & Steel Co., Sydney, N. S., have sufficient orders on hand to keep rail mills going at the present rate until about June 1.

Pig Iron.—Forward buying has fallen off because most melters are covered up to the end of March and some to the end of June. Hand-to-mouth buyers are responsible for the greater part of current demand for foundry and malleable iron. A small number have increased their daily melt. Orders for 100 to 200 tons are fairly common, and inquiries are being received for as high as 500 or 600 tons for immediate delivery. Deliveries against contract are also being speeded up. Imports of iron are holding to a high level. The Algoma Steel Corporation will soon blow in No. 4 blast furnace to take the place of one damaged recently by an explosion. Prices have become firmer and shading is gradually disappearing.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75	$23.60
No. 2 foundry, sil. 1.75 to 2.25	23.60
Malleable	23.60
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75	25.00
No. 2 foundry, sil. 1.75 to 2.25	25.00
Malleable	25.00
Basic	24.00
Imported Iron at Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Old Material.—The quiet state of the market has had a softening effect on some prices in Toronto and Montreal. Toronto dealers have recently purchased heavy melting steel at $8.50 per ton as against a former price of $9. A few other lines have been purchased below present market quotations. In the Montreal market dealers are now offering $20 per ton for wrought iron axles and $18 for steel axles as against former prices of $21 and $19 respectively. Other prices are unchanged. Shipments to United States buyers are running into larger tonnages than a month or six weeks ago.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel	$9.00	$8.00
Rails, scrap	10.00	10.00
No. 1 wrought	9.00	11.00
Machine shop turnings	7.00	6.00
Boiler plate	7.00	7.00
Heavy axle turnings	7.50	7.50
Cast borings	7.50	6.00
Steel turnings	7.00	6.50
Wrought pipe	5.00	6.00
Steel axles	14.00	19.00
Axles, wrought iron	16.00	21.00
No. 1 machinery cast	....	16.00
Stove plate	....	12.00
Standard carwheels	....	14.50
Malleable	....	13.00
Per Net Ton		
No. 1 machinery cast	15.00	....
Stove plate	9.00	....
Standard carwheels	13.00	....
Malleable scrap	13.00	....

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ⅞-in. and over	3.15c.
Small angles, under ⅞-in	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.80c.
Blue annealed sheets (No. 10)	3.75c.
Galvanized sheets (No. 24)	5.35c.
Structural rivets, ½-in. and larger	5.65c.
Common wire nails, base per keg	$3.35
Cement coated nails, 100-lb. keg	3.35

San Francisco

Southern Pacific Buys 3200 Tons of Track Spikes and Bolts

SAN FRANCISCO, Jan. 28 (*By Air Mail*).—Bookings of iron and steel products this week were mostly small lots. Considerable new work, however, is being figured on or is about to come out. The most important award of the week involved nearly 3200 tons of track spikes and bolts for the Southern Pacific Co., San Francisco.

Pig Iron.—Sales and inquiries are confined to unimportant lots. Prices are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.25

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Pending business calls for more than 20,000 tons. The largest inquiry involves about 5000 tons for a department store in Oakland. Prices continue firm at 2.35c., c.i.f.

Plates.—Demand for plates is practically at a standstill. No awards of importance or new inquiries have developed. Several Northwestern pipe line projects requiring over 3000 tons are expected to come up for figures in the near future. Producers are quoting 2.25c., c.i.f.

Bars.—The Pacific Fruit Express Co. has bought 475 tons of merchant bars and bands. The largest concrete bar award called for 200 tons for a dormitory at the University of California, Berkeley, and was booked by the Steel Service Co. Pending business does not involve a large total. Prices in the San Francisco district on out-of-stock material continue weak and as low as 2.25c. continues to be quoted in some instances.

Cast Iron Pipe.—Awards of cast iron pipe this week, with one exception, called for lots of less than 100 tons. R. H. Downer, San Diego, was awarded 155 tons of 4 and 6-in. class B pipe for improvement of Boundary Street, San Diego, Cal. Chowchilla, Cal., purchased standard pipe instead of 188 tons of 4 to 8-in. class B pipe. Pending business exceeds 3500 tons. Inquiries include 261 tons of 4 to 8-in. class B or centrifugal pipe for Pasadena, Cal., bids on which open Feb. 2; 137 tons of 4 to 10-in. class B pipe for Modesto, Cal., and 119 tons of 8-in, class B pipe for Eureka, Cal., bids on which go in on Feb. 7. During the past week bids were received on 264 tons of 4 to 8-in. class B pipe for the improvement of Voltaire Street, San Diego, Cal. Bert Noble was low bidder.

Track Material.—The Southern Pacific Co., San Francisco, has placed 28,000 kegs of track spikes, 2800 tons, and 3200 kegs of track bolts, 320 tons, with unnamed producers. No action has yet been taken on its inquiry for 4500 tons of tie plates. Bids were opened this week for the rehabilitation of the municipal railway system at Phoenix, Ariz., and Claude Fisher of Los Angeles submitted the only bid. This work involves 1500 tons of 70 and 75-lb. standard T rails.

Coke.—Sales and inquiries are limited to small lots. Prices continue unchanged.

Prescribes New Rates on Steel Products to Oklahoma and Texas

WASHINGTON, Jan. 31.—Rates, based on those prescribed in the Consolidated Southwestern cases, were prescribed by the Interstate Commerce Commission in a decision made public last Saturday to apply on shipments of iron and steel products, in carloads, from points in Pennsylvania, Ohio, Indiana, Illinois, Missouri, Kansas, Kentucky, Tennessee and Alabama and on shipments of iron or steel wire rope, in carloads, from Kansas City, Mo., to destinations in Oklahoma and Texas. The decision involved a number of complaints and after declaring existing rates unreasonable, provided for reparation.

Boston

Cold-Rolled Strip Prices Revised—Pig Iron Quiet—Scrap Weak

BOSTON, Jan. 31.—Pig iron sales the past week probably did not exceed 2000 tons, of which the Mystic stack took fully half. For the little business closed there was practically no competition. Furnaces east of Buffalo held to prices equivalent to $16.50 to $17 a ton, base Buffalo. Sales included 300 tons of Lake charcoal iron at $24 a ton, base furnace. A Massachusetts foundry is still negotiating for 1000 tons of No. 2 plain and No. 2X iron, and there is somewhat more inquiry for small tonnages with deliveries running into the second quarter. The most encouraging news is that the New England iron melt is increasing, particularly among the largest foundries.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25	$21.41 to $21.91
Buffalo, sil. 2.25 to 2.75	21.91 to 22.41
East. Penn., sil. 1.75 to 2.25	23.15
East. Penn., sil. 2.25 to 2.75	23.65
Virginia, sil. 1.75 to 2.25	25.71
Virginia, sil. 2.25 to 2.75	26.21
Alabama, sil. 1.75 to 2.25	22.91 to 24.77
Alabama, sil. 2.25 to 2.75	23.41 to 25.27

Freight rates: $4.91 from Buffalo, $3.65 from eastern Pennsylvania, $5.21 all rail from Virginia, $6.91 to $8.77 from Alabama.

Coke.—By-product domestic coke was in excellent demand the past week owing to low temperatures and small stocks in distributers' hands. Domestic coke is selling on a basis of $8.50 a ton on cars, Everett, Mass. Specifications against first half foundry coke contracts are increasing. Foundry coke remains at $11.50 a ton, delivered within a $3.10 freight rate zone.

Cast Iron Pipe.—Malden, Mass., has awarded 300 tons of pipe to an unnamed foundry. Lowell, Mass., closed bids on Jan. 28 for 100 tons of 6 to 12-in. pipe, and Leominster, Mass., closes this week on 300 tons of 16-in. Gardner, Mass., closed bids several days ago on 150 tons of 6 and 8-in. pipe, but no award has been made, and Stone & Webster, Inc., has yet to close on 2000 tons of gas pipe. Private business slowed up somewhat the past week, but is still of fair proportions. The market for small pipe remains firm, but concessions are still available on large dimensions. On private business 4-in. pipe is selling at $45.10 to $46.10 a ton, delivered common Boston freight rate points, and 6 to 12-in. at $41.10 to $42.10. The usual $5 differential is asked on class A and gas pipe.

Cold-Rolled Strip Steel.—New England makers of cold-rolled strip have revised their quotations to conform to the new prices recently named by mills in the Pittsburgh and Cleveland districts. Current specifications are satisfactory in volume. Most Eastern mills have a good tonnage on their books. The Worcester mill is now quoting 3.30c. per lb. for lots under 3 tons and 3.05c. for larger lots.

Warehouse Business.—Wire nails out of warehouses are no higher despite the recent mill advance of $2 a ton to $2.65 per keg, base. A large stock held by one jobber is still offered at the old prices.

Old Material.—Prices for most kinds of scrap are steady and unchanged despite a falling off in business. Railroad wrought, however, is 50c. a ton lower, and $6.26 a ton on cars is the average price for steel turnings, as against $6.50 a week ago, although some recent sales were made at $6.60. For forge flashings $6.50 a ton on cars is the average price today, but sales were made the past week at $6, $7 and $7.25. One local firm is paying $13.50 to $14 a ton for shafting for Pennsylvania delivery, but a majority of dealers are not doing better than $13 to $13.50. Shipments of chemical borings are on old orders only, and the market is 50c. a ton lower. Textile cast is in liberal supply at $14 to $14.50 a ton delivered New England points, with few takers. Some business recently was closed at slightly better prices for Pennsylvania delivery. The Boston & Albany Railroad yesterday closed bids on approximately 1000 tons of miscellaneous material, and the Boston Elevated Railroad today on 1000 tons of girder rails and two cars of small scrap.

Buying prices per gross ton f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$9.00 to $9.25
Scrap rails	8.50 to 8.75
No. 1 railroad wrought	10.00 to 10.50
No. 1 yard wrought	8.00 to 8.50
Machine shop turnings	6.00 to 6.25
Cast iron borings (steel works and rolling mill)	6.00 to 6.25
Bundled skeleton, long	6.00 to 6.50
Forge flashings	6.50 to 7.00
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	6.00 to 6.50
Shafting	13.00 to 13.50
Steel car axles	15.50 to 16.00
Wrought pipe (1 in. in diameter, over 2 ft. long)	8.00 to 8.50
Rails for rerolling	10.00 to 10.50
Cast iron borings, chemical	9.50 to 10.00

Prices per gross ton delivered consumers' yards:

Textile cast	$14.00 to $14.50
No. 1 machinery cast	14.50 to 15.00
No. 2 machinery cast	12.50 to 13.00
Stove plate	11.00
Railroad malleable	13.00 to 13.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons	*3.35c. to 5.35c.
Squares and flats	*3.85c. to 5.85c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.

	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Cincinnati

Sheet Mill Operations Gain—Scrap Market Weakens

CINCINNATI, Jan. 31.—While pig iron consumers are specifying at a moderate rate against first quarter contracts, fresh sales have been of small volume and the market is devoid of sizable inquiries. There has been a slight gain in foundry operations, but the current basis of production is not considered satisfactory. A local dealer has sold 500 tons of foundry iron to an Indiana melter and a like amount to another company in this district. The price structure remains unchanged, with the Lake Erie sellers quoting from $16.50 to $17, base furnace, and southern Ohio makers asking $19, base Ironton. Southern iron is firm at $16, base Birmingham. Movement of Jackson County silvery iron has been slow.

The Hamilton Coke & Iron Co., Hamilton, Ohio, will begin operation of its blast furnace and by-product coke ovens in April. By that time construction of the railroad from the site of the plant to the East Side works of the American Rolling Mill Co. at Middletown will be completed and the new furnace will begin supplying hot metal to the East Side open-hearths. When the furnace is lighted, the American Rolling Mill Co. is expected to blow out one furnace at Columbus and may continue, temporarily at least, the operation of the second Columbus furnace on foundry iron for the merchant trade.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$20.89
So. Ohio malleable	$20.14 to 20.89
Alabama fdy., sil. 1.75 to 2.25	19.69
Alabama fdy., sil. 2.25 to 2.75	20.19
Tennessee fdy., sil. 1.75 to 2.25	19.69
Southern Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—The gradual expansion of operations among consuming industries is proving of benefit to producers of finished steel. Many contract customers are authorizing the release of first quarter tonnages, while other buyers have been forced to come into the market and pay the new prices. The lack of major building projects is being felt in structural steel. Small fabricators are taking an increasing number of awards ranging from 100 tons downward, and so far as work on hand is concerned, are in the best position in several months. Bars, structural shapes and plates are quoted at 1.85c., base Pittsburgh, for first quarter delivery. In the sheet market conditions are regarded as satisfactory, with specifications and orders in January considerably in excess of those in January, 1927. The American Rolling Mill Co. reports that bookings in the past 30 days have been substantially greater than its producing capacity and that sales have been well distributed among all classes of buyers. The demand for its specialty grades of sheets has been particularly heavy, the volume of orders having been sufficient to carry operations well through the remainder of the quarter. All of the company's plants are operating on a basis which approaches full capacity. Prices are being well maintained on black and blue annealed sheets, which are quoted at 2.90c. and 2.10c., base Pittsburgh, respectively. On galvanized sheets, however, irregularities still are reported from the South, where concessions of from $1 to $2 a ton have been given. Sellers of wire goods have announced an increase of $2 a ton in common wire nails and in plain wire. The former is now priced at $2.65 a keg, Pittsburgh or Ironton, and the latter at $2.50 per 100 lb., Pittsburgh or Ironton. Consumers with first quarter contracts are protected at the old prices.

Reinforcing Bars.—New billet bars are quoted at 1.85c., base Pittsburgh, and rail steel stock at 1.75c., base mill.

Warehouse Business.—January closes with shipments out of local warehouses running about 5 per cent ahead of those in the corresponding month of 1927. The number of orders placed recently has been large, but the tonnage in the aggregate has been unsatisfactory. Prices are firm.

Coke.—By-product foundry coke will continue during February at the present price of $7.50 per net ton, f.o.b. ovens, or $9.62, delivered Cincinnati. In domestic grades walnut size is quoted at $5, ovens; No. 2 nut at $4.50 and egg at $5.50. At Detroit there will be no change in quotations the coming month. Shipments of foundry coke to automobile foundries are well maintained, but demand from jobbing foundries has been light. Prices of New River and Wise County beehive foundry coke are firm, although sales in this territory have been small.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, $9.52 to $9.64; Wise County coke, $7.59 to $8.09; New River coke, $10.09 to $10.59. Freight rates: $2.14 from Ashland, Ky.; $2.59 from Wise County and New River ovens.

Old Material.—There has been a reaction among dealers, who find that mills will buy material only if concessions are made from present prices. Therefore it is the opinion of the trade that quotations are likely to dip slightly. The Norfolk & Western has put out a fair-sized list.

Dealers' buying prices per gross ton f.o.b. cars, Cincinnati:

Heavy melting steel	$11.75 to $12.25
Scrap rails for melting	12.50 to 13.00
Loose sheet clippings	9.00 to 9.50
Bundled sheets	9.50 to 10.00
Cast iron borings	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.50 to 8.00
Rails for rolling	13.00 to 13.50
No. 1 locomotive tires	13.50 to 14.00
No. 1 railroad wrought	11.50 to 12.00
Short rails	17.00 to 17.50
Cast iron carwheels	13.00 to 13.50
No. 1 machinery cast	16.00 to 17.00
No. 1 railroad cast	13.50 to 14.00
Burnt cast	8.00 to 8.50
Stove plate	9.25 to 9.75
Brake shoes	10.00 to 10.75
Railroad malleable	12.75 to 13.25
Agricultural malleable	12.25 to 12.75

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, soft steel or iron	3.30c.
Reinforcing bars	3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue annealed sheets (No. 10)	3.60c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base 100 lb. keg	2.95
Chain, per 100 lb	7.55
	Net per 100 Ft.
Lap-welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Detroit

Steel Requirements Increasing in Motor Industry and Other Lines

DETROIT, Jan. 31.—The demand for steel in the Detroit district continues steadily upward, and while the automotive industry is the largest factor, industrials generally are increasing steel consumption. As nearly as can be estimated, the increase in volume of bookings has been running about 4 per cent a week since early in January.

The general offices of the Ford Motor Co. were moved this week from Highland Park to the new $2,000,000 administration building at Fordson. The Ford payroll has been climbing steadily and now numbers 89,788, as of Jan. 27. The increase since the previous report, Jan. 14, is 3729, and this recruiting program is expected to continue until production has reached 2000 cars a day.

The Hudson Motor Car Co. has signed a contract for an additional two-story building, 80 x 640 ft., which will be rushed to completion. A number of divisions of the machine shops of the Hudson Motor Car Co. have recently been put on a two-shift a day basis, and a few divisions on full 24-hr. operation. A full night force is in process of organization.

The advance in bars, shapes and plates to 1.85c., Pittsburgh, is driving in a number of small orders.

An advance of 50c. per ton has been obtained on several small sales of pig iron.

The market on old material shows no further signs of weakness.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Heavy melting and shoveling steel	$12.00 to $12.50
Boring and short turnings	9.00 to 9.50
Long turnings	7.75 to 8.25
No. 1 machinery cast	16.00 to 17.00
Automobile cast	18.00 to 19.00
Hydraulic compressed sheets	10.75 to 11.25
Stove plate	11.50 to 12.50
No. 1 busheling	9.50 to 10.00
Sheet clippings	7.50 to 8.00
Flashings	10.00 to 10.50

Increased Freight Rates on Steel Drums Ordered Canceled

WASHINGTON, Jan. 31.—Proposed increased freight rates on iron or steel barrels or drums in carload lots from points on and north of the Ohio River and on and east of the Mississippi River and from Memphis and Nashville, Tenn., to New Orleans and points in the Mississippi Valley territory taking the same or related rates were found by the Interstate Commerce Commission not to be justified, in a decision announced last Saturday. The suspended schedules were ordered canceled, but without prejudice to the filing of new ones naming the same proposed rates to apply on new iron or steel barrels or drums of United States Standard gage No. 19 or thicker, in minimum-weight car lots of 13,000 lb. per 36-ft. 6-in. car, subject to Rule 34 of the Consolidated Classification. The carriers were given permission to establish the proposed sixth-class rates on old iron or steel barrels or drums of any thickness.

NON-FERROUS METAL MARKETS

The Week's Prices

Cents per Pound for Early Delivery

	Jan. 31	Jan. 30	Jan. 28	Jan. 27	Jan. 26	Jan. 25
Lake copper, New York	14.25	14.25	14.25	14.25	14.25	14.25
Electrolytic copper, N. Y.*	13.87½	13.87½	13.87½	13.87½	13.87½	13.87½
Straits tin, spot, N. Y.	54.62½	54.87½	...	55.25	54.75	55.12½
Lead, New York	6.50	6.50	6.50	6.50	6.50	6.50
Lead, St. Louis	6.30	6.30	6.30	6.30	6.30	6.30
Zinc, New York	6.02½	6.02½	6.02½	6.02½	6.02½	6.02½
Zinc, St. Louis	5.67½	5.67½	5.67½	5.67½	5.67½	5.67½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Jan. 31.—Activity is not pronounced in any of the markets. There has been very little demand for copper, but prices are firm. Sales of tin have been moderate at receding quotations. The lead market is steady. Demand for zinc is fairly good, with the market a little stiffer.

Copper.—Very little demand is reported from either domestic or foreign sources, so much so that prices are largely nominal. Electrolytic copper is firm at 14.12½c., delivered in the Connecticut Valley, with only one custom smelter reported willing to shade this price to about 14.05c. to 14.07½c. Copper Exporters, Inc., continues to maintain its official quotation at 14.50c., c.i.f. usual European ports. Lake copper is quoted unchanged at 14.25c., delivered.

Copper Averages.—The average price of Lake copper for January, based on daily quotations in THE IRON AGE, was 14.25c. The average price of electrolytic copper was 13.85c., refinery, or 14.10c., delivered in the Connecticut Valley.

Tin.—Sales for the week ended Saturday, Jan. 28, were light at about 850 tons. Dealers were the principal buyers, consumers being uninterested. Yesterday, Monday, the market was also sluggish, with only 50 tons changing hands, and today conditions have been similar. The only feature of the market is the fact that sales at Singapore continue in good volume. Official data of deliveries into consumption will not be available for a day or two, but American estimates place the total for January at 5415 tons. Prices in London today were about £3 to £4 per ton less than a week ago, with spot standard quoted at £247 7s. 6d., future standard at £247 5s., and spot Straits at £247 15s. The Singapore price today was £252 10s. Spot Straits tin was quoted today at 54.62½c., New York.

Lead.—A moderate business is reported at 6.27½c. to 6.30c., St. Louis. The market is steady and producers are not forcing the issue, but maintaining their quotations. The leading interest continues to quote 6.50c., New York, as its contract price.

Zinc.—Ore prices at Joplin advanced last week to $37, but there was not a corresponding increase in the price of prime Western zinc. The market, however, is a little stronger at 5.67½c., St. Louis, or 6.02½c., New York, but possibly this could be shaded in some cases to 5.65c. Some producers report a fair volume of business each day in the past week, but in most cases the metal has to be offered to the consumer. Sales of ore last week at close to 12,000 tons were about equal to the production, stocks still being very high but remaining in strong hands.

Nickel.—Ingot nickel in wholesale lots is quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Antimony.—Consuming demand continues in fair volume. Chinese metal for spot and early future delivery is quoted at 11.25c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, in ingots, is quoted at 23.90c., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Jan. 31.—This market is moderately active and prices, with the exception of tin, have held firm. For the most part current sales are for delivery in February. The old metal market is a trifle more active and prices are steady.

Prices, per lb., in carload lots: Lake copper, 14.25c.;

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	57.00c. to 58.00c.
Tin, bar	59.00c. to 60.00c.
Copper, Lake	15.25c.
Copper, electrolytic	15.00c.
Copper, casting	14.25c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig	7.65c. to 8.65c.
Lead, bar	9.90c. to 10.90c.
Antimony, Asiatic	13.00c. to 13.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure)	27.00c. to 28.00c.
Aluminum ingots, No. 12 alloy	26.00c. to 27.00c.
Babbitt metal, commercial grade	30.00c. to 40.00c.
Solder, ½ and ½	39.25c. to 40.25c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	61.00c.
Tin, bar	63.00c.
Copper, Lake	15.25c.
Copper, electrolytic	15.25c.
Copper, casting	14.50c.
Zinc, slab	7.75c.
Lead, American pig	7.25c.
Antimony, Asiatic	16.00c.
Lead, bar	9.50c.
Babbitt metal, medium grade	19.75c.
Babbitt metal, high grade	65.75c.
Solder, ½ and ½	36.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.50c. to 19.25c.
Copper, hot rolled	22.75c. to 23.75c.
Copper, cold rolled, 14 oz. and heavier	25.25c. to 26.25c.
Seamless Tubes—	
Brass	23.37½c. to 24.37½c.
Copper	24.50c. to 25.50c.
Brazed Brass Tubes	26.50c. to 27.50c.
Brass Rods	16.25c. to 17.25c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.00c. to 11.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not been changed since Dec. 5. Zinc sheets are still being quoted at 10c., base, and lead full sheets remain at 10c. to 10.25c.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Zinc	10.00c.
Lead (full sheets)	10.00c. to 10.25c.
Seamless Tubes—	
High brass	23.62½c.
Copper	24.50c.
Rods—	
High brass	16.50c.
Naval brass	19.25c.
Wire—	
Copper	15.75c.
High brass	19.25c.
Copper in Rolls	21.75c.
Brazed Brass Tubing	26.75c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

	Base per Lb.
Sheets—	
High brass	18.75c.
Copper, hot rolled	22.75c.
Copper, cold rolled, 14 oz. and heavier	25.00c.
Zinc	11.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	25.12½c.
Copper	26.00c.
Brazed Brass Tubes	26.75c.
Brass Rods	16.50c.

tin, 56.50c.; lead, 6.35c.; zinc, 5.75c.; in less-than-carload lots, antimony, 12.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 6.75c.; lead pipe, 5c.; zinc, 3.25c.; pewter, No. 1, 34c.; tin foil, 40c.; block tin, 50c.; aluminum, 12.50c.; all being dealers' prices for less-than-carload lots.

RAILROAD EQUIPMENT

Pennsylvania Orders 600 Passenger and Baggage Coaches—1250 Freight Cars Purchased

Purchase of 600 passenger and baggage coaches by the Pennsylvania was the outstanding feature of the week's market. The Central of Georgia and the Chesapeake & Ohio have each placed orders for 500 freight cars and the Norfolk & Western will build 250 gondolas in its own shops. Details of the week's business follow:

Long Island Railroad has ordered 10 baggage cars from American Car & Foundry Co.

St. Louis Southwestern has placed six caboose car underframes with Virginia Bridge & Iron Co.

Fruit Growers Express has purchased 240 refrigerator car underframes from Pressed Steel Car Co.

Pennsylvania Railroad has placed orders for 613 passenger and baggage coaches, distributed as follows: 50 passenger coaches, with Pressed Steel Car Co.; 150 passenger coaches, with Standard Steel Car Co., 88 passenger coaches, with Bethlehem Steel Co.; 125 baggage cars, with American Car & Foundry Co.; 85 baggage cars, with St. Louis Car Co.; seven gas-electric cars, with J. G. Brill Co.; six gas-electric cars, with Pullman Car & Mfg. Corporation, and 20 passenger and baggage, 12 passenger coaches, 45 baggage-scenery and 25 horse-express cars, with its own shops.

Lehigh & New England has placed orders with American Car & Foundry Co. for repairs to 200 50-ton hopper cars.

H. C. Frick Coke Co. has ordered repairs to 641 70-ton hopper cars, distributed as follows: 137, with American Car & Foundry Co.; 274, with Greenville Steel Car Co.; 137, with Standard Steel Car Co., and 89, with an unnamed builder.

Central of Georgia has ordered 500 gondola cars from Tennessee Coal, Iron & Railroad Co.

Illinois Central has ordered two air dump cars from Differential Car Co.

Chesapeake & Ohio has ordered 200 70-ton steel hopper-bottom gondola cars from American Car & Foundry Co. and 300 similar units from Richmond Car Works.

Norfolk & Western will build 250 gondola cars and 30 locomotive tenders at its Roanoke, Va., shops; this railroad is also taking bids on rebuilding 1000 57½-ton hopper cars.

Chicago Great Western has ordered 50 stock car and five caboose car underframes from Bradford Corporation.

New England Fuel & Transportation Co. has purchased 50 mine cars from Bethlehem Steel Co.

Texas & Pacific has ordered two all-steel private cars from American Car & Foundry Co.

Nashville, Chattanooga & St. Louis has ordered two 70-ton combination passenger-baggage cars and two 70-ton baggage cars from American Car & Foundry Co.

St. Louis-San Francisco has purchased 15 steel baggage and mail and five steel baggage cars from American Car & Foundry Co.

Union Pacific will buy six gas-electric cars and eight trailers.

Great Northern has ordered five combination baggage and mail gas-electric cars from J. G. Brill Co.

Old Metals, Per Lb., New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators and the selling prices are those charged consumers after the metal has been properly prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.00c.	13.50c.
Copper, heavy and wire	11.75c.	12.875c.
Copper, light and bottoms	9.75c.	11.00c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition	9.50c.	10.75c.
No. 1 yellow brass turnings	7.75c.	9.00c.
No. 1 red brass or composition turnings	8.75c.	9.75c.
Lead, heavy	5.25c.	5.625c.
Lead, tea	4.25c.	4.75c.
Zinc	3.75c.	4.25c.
Sheet aluminum	12.75c.	14.50c.
Cast aluminum	12.75c.	14.50c.

REINFORCING STEEL

New Projects Include 2000 Tons for Cleveland Bridge—Awards of Only 5600 Tons

New projects totaling more than 3000 tons were larger than in the previous week, but less than in other weeks since the first of the year. The largest inquiry was 2000 tons for the Cuyahoga bridge in Cleveland. Awards of 5600 tons included 1600 tons for the Willys-Overland Co. factory building in Toledo, Ohio, and 500 tons for the Nassau-Broad Street subway in New York. Awards follow:

EAST BOSTON, 475 tons, Border Street outlet, to Concrete Steel Co.

NEW YORK, 500 tons, section of Nassau-Broad Street subway; from Marcus Contracting Co., general contractor, to McClintic-Marshall Co.

GARDEN CITY, N. Y., 250 tons, warehouse for Great Atlantic & Pacific Tea Co., to Igoe Brothers.

CHICAGO, 300 tons of rail steel bars, apartment building at 222 Chestnut Street, to Inland Steel Co.

CHICAGO, 400 tons of rail steel bars, apartment building at Kenmore and Lawrence Avenues, to Inland Steel Co.

CHICAGO, 200 tons of rail steel bars, Lawyers Building, to Inland Steel Co.

TOLEDO, 1600 tons, Willys-Overland Co. building, to Building Products Co., local.

CHICAGO, 310 tons of rail steel bars, apartment building at 5346 Cornell Avenue, to Inland Steel Co.

STATE OF ILLINOIS, 500 tons of rail steel bars, State road work, to Olney J. Dean & Co.

ST. LOUIS, 600 tons (380 tons rails, 120 tons billets), Arsenal Street viaduct, to Laclede Steel Co.

SAN FRANCISCO, 475 tons merchant bars and angles for Pacific Fruit Express, to unnamed company.

OAKLAND, CAL., 100 tons, Women's Athletic Club, to San Francisco jobber.

BERKELEY, CAL., 200 tons, girls' dormitory, University of California, to Steel Service Co.

ORLAND, CAL., 331 tons, Stony Gorge Dam, 286 tons to Laclede Steel Co. and 45 tons to Pacific Coast Steel Co., instead of 286 tons and 45 tons respectively to Pacific Coast and Laclede companies as reported last week.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

CHICAGO, 200 tons, Stop & Shop Building.

CHICAGO, 200 tons, apartment building at 5421 Cornell Avenue; William Reichert, architect.

CHICAGO, 200 tons, laboratory for University of Chicago.

CHICAGO, 300 tons, garage; Fox & Fox, architects.

CHICAGO, 130 tons, Edgewater Hospital; Dwight D. Wallace, architect.

JEFFERSON CITY, MO., 130 tons, office building for Missouri Highway Commission.

CLEVELAND, 2000 tons, deck structure for Cuyahoga River bridge.

The Youngstown Sheet & Tube Co., Youngstown, has purchased the entire capital stock of the Associated Supply Co., 724 Pacific Electric Building, Los Angeles, pipe distributer, but will continue to operate the company under its own name. Bernard Dunn, vice-president of the company, will be manager.

FABRICATED STRUCTURAL STEEL

Santa Fe Bridge Requirements 20,000 Tons—Awards Total 29,000 Tons

With the inquiry of the Atchison, Topeka & Santa Fe Railroad for 20,000 tons for 1928 bridge work, new business developed in the last week amounted to 44,750 tons. The week's awards of 29,000 tons included 4500 tons for a bridge at Vicksburg, Miss., and 3300 tons for subway work in New York. Awards follow:

DETROIT, 1700 tons, building for city water board, to Mahon Structural Steel Co.

PHILADELPHIA, 300 tons, Northeastern Title & Trust Co. building, to Bethlehem Fabricators.

PROVIDENCE, R. I., 1100 tons, Court House, to Lehigh Structural Steel Co.

CAMBRIDGE, MASS., 605 tons for Lever Brothers; warehouse, 475 tons, to New England Structural Co., and plant alterations, 130 tons, to Boston Bridge Works, Inc.

BOSTON, 150 tons, McMillan stores on Newbury Street, to Lehigh Structural Steel Co.

LEOMINSTER, MASS., 100 tons, theater, to James H. Tower Iron Works, Providence.

SPRINGFIELD, MASS., 400 tons, hotel, to Levering & Garrigues.

RUTLAND, VT., 150 tons, bridge, to American Bridge Co.

SCARSDALE, N. Y., 200 tons, school, to American Bridge Co.

NEW YORK, 3300 tons, section of Nassau-Broad Street subway, to McClintic-Marshall Co.

NEW YORK, 2200 tons, addition to Savoy Plaza Hotel, Fifth Avenue and Fifty-ninth Street, to American Bridge Co.

NEW YORK, 1200 tons, loft building on West Thirty-sixth Street, to Harris Structural Steel Co.

NEW YORK, 700 tons, apartment building on East Fifty-ninth Street, to Paterson Bridge Co.

NEW YORK, 600 tons, overhead drive on Park Avenue at Grand Central Station, to Taylor-Fichter Steel Construction Co.

NEW YORK, 300 tons, Woolworth Building at Vesey and Church Streets, to Harris Structural Steel Co.

CROTON, N. Y., 400 tons, highway bridge, to unnamed local fabricator.

EAST ORANGE, N. J., 800 tons, apartment building, to McClintic-Marshall Co.

EAST ORANGE, 900 tons, apartment building, to Hedden Iron Construction Co.

LANCASTER, PA., 400 tons, passenger station for Pennsylvania Railroad, to McClintic-Marshall Co.

WASHINGTON, 1200 tons, telephone building, to Lehigh Structural Steel Co.

HOPEWELL, VA., 1000 tons for Atmospheric Nitrogen Corporation, to Lackawanna Steel Construction Corporation, Buffalo.

CINCINNATI, 250 tons, building for Meyer Packing Co., to L. Schreiber & Sons Co.

VICKSBURG, MISS., 4500 tons, bridge for Vicksburg Bridge & Terminal Co., to Virginia Bridge & Iron Co., Birmingham.

CHICAGO, 2400 tons, garment center building, reported to have been taken by McClintic-Marshall Co.

CHICAGO, 350 tons, Naylor Spiral Pipe Co., to Midland Structural Steel Co., local.

CHICAGO, 340 tons, Wieland Dairy Co., to A. Bolter's Sons, local.

STARVED ROCK, ILL., 1700 tons, lock gates on Illinois River, to Independent Bridge Co., Pittsburgh.

MILWAUKEE, 300 tons, rebuilding Wells Street viaduct for Milwaukee Electric Railway & Light Co., to Milwaukee Structural Steel Co.

TORONTO, ONT., 1300 tons, *Toronto Star* Building, to Dominion Iron & Steel Co.

SAN FRANCISCO, 180 tons, plain material for Pacific Fruit Express Co., to unnamed interest.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

PHILADELPHIA, 520 tons, Uptown Theater for Stanley Co. of America; general contract to Cramp & Co.

NEWARK, N. J., 2000 tons, station at Journal Square, bid in.

BOSTON, 270 tons, bridge over Boston & Albany Railroad.

MIDDLETOWN, CONN., 200 tons, savings bank.

NEW YORK, 1000 tons, apartment building on Fifth Avenue.

NEW YORK, 1200 tons, tanks for the Pan-American Co.

JAMAICA, N. Y., 1000 tons, theater.

JAMAICA, 500 tons, public library.

NEW YORK CENTRAL LINES, 3350 tons, four steel car floats; Dravo Contracting Co., Pittsburgh, low bidder. New bids to be asked on 10 steel derrick lighters and five steel deck scows.

PITTSBURGH, 5500 tons, Thirty-first Street bridge, bids opened Feb. 2.

ATCHISON, TOPEKA & SANTA FE, 20,000 tons for 1928 bridge work.

NORTHERN PACIFIC RAILROAD, 2000 tons, bridges.

BOGALUSA, LA., 200 tons, building for Bogalusa Paper Co.

CORPUS CHRISTI, TEX., 400 tons, dock shed.

MISSOURI-KANSAS-TEXAS, 500 tons, bridges.

CHICAGO, 1800 tons, Sheridan Towers apartment hotel; Holabird & Roche, architects.

CHICAGO, 900 tons, apartment building at 1325 Astor Street.

SCHILLER PARK, ILL., 1300 tons, viaduct for Minneapolis, St. Paul & Sault Ste. Marie.

DES MOINES, IOWA, 1400 tons, building for Bell Telephone Co.

BURLINGTON, IOWA, 325 tons, steel wharf boat for Burlington Dock Board; St. Louis Steel Construction Co., low bidder.

BOISE, IDAHO, 233 tons, bridge over Clark Fork River, Sanders County; bids opened.

SAN FRANCISCO, 800 tons sheet piling, Coyote Point bridge; bids being taken.

OAKLAND, CAL., 100 tons, warehouse on Peralta Street; bids received.

Youngstown-Inland Steel Merger

(*Concluded from page* 343)

hot black sheet mills, eight stands of cold rolls, 19 box annealing furnaces, and six galvanizing pots.

Ingot Capacity of 1,800,000 Tons

The plant has an annual capacity of 1,800,000 tons of steel ingots, 1,416,000 tons of semi-finished products, 240,000 tons of rails, 150,000 tons of heavy structural shapes, 132,000 tons of light structural shapes, 40,000 tons of universal plates, 160,000 tons of sheared plates, 300,000 tons of merchant and concrete reinforcing bars, 50,000 tons of blue annealed sheets, 140,000 tons of black sheets, 75,000 tons of galvanized sheets and 30,000 gross tons of rivets and track bolts, nuts and spikes.

At Chicago Heights the company operates a 14-in. rail slitting bar mill with an annual capacity of 60,000 tons of rail steel bars. At Milwaukee the company has 10 hot black sheet mills, five stands of cold rolls, four double-box annealing furnaces and five galvanizing pots. The yearly capacity of this plant is 60,000 tons of sheets.

Republic-Trumbull Consolidation Approved

THE absorption of the Trumbull Steel Co. by the Republic Iron & Steel Co. also has been approved by the stockholders of those companies and on the basis of exchange announced when the controlling interests in these companies reached an agreement several weeks ago. Common stockholders of the Trumbull company are to receive one share of Republic common stock for six shares of Trumbull common stock and the basis of the preferred stock exchange of the companies is one share of Republic common for one and six-tenths of Trumbull preferred. This involves the issuance of 300,000 additional common shares of Republic common stock.

The work of putting the two companies together now is in progress and details as to personnel of the combined companies will be announced in the next week or ten days. The name of the new company will be the Republic Iron & Steel Co. and the name of the Trumbull Steel Co. will be dropped. The Trumbull plant will be devoted to the production of strip and tin plate, the plan being to double its capacity for tin plate production. Many of the men now at Warren, Ohio, the location of the Trumbull plant, will be transferred to Youngstown, which will be the location of the general offices.

PERSONAL

New Link-Belt Vice-Presidents

George P. Torrence, George L. Morehead, Frank B. Caldwell and W. C. Carter, whose appointments as vice-presidents of the Link-Belt Co., Chicago, were announced in THE IRON AGE of Dec. 29, all have been associated with the company for a number of years.

G. P. TORRENCE

G. L. MOREHEAD

Mr. Torrence, who will have charge of the company's operation and sales at Indianapolis, with headquarters in that city, is a graduate of Purdue University. Before joining the Link-Belt Co. in 1911 as a draftsman at its Indianapolis works, he was identified with the Marion Malleable Iron Co., Marion, Ind.; the Air Lord Tie Co., Little Rock, Ark., and the Westinghouse Air Brake Co., Pittsburgh. In 1915 he was transferred to the general sales department at the Link-Belt Chicago office, and was made manager of the department in 1918. He became sales manager at

F. B. CALDWELL

W. C. CARTER

Chicago in 1919, and the following year was transferred to Indianapolis. He was made general manager of the Indianapolis plant in 1925.

Mr. Morehead will have charge of Eastern operations and sales, with headquarters at Philadelphia. He was graduated from the University of Missouri in 1902 and joined the Link-Belt organization in 1906. He was successively maintenance engineer, superintendent of construction and chief engineer at the Chicago plant, and in 1919 became assistant manager of the Ewart plant, Indianapolis. In 1920 he became general manager of that plant and five years later was transferred to Philadelphia as manager of the plant in that city.

Mr. Caldwell, who will be in charge of the Chicago plant and of sales offices in that territory, was graduated from Cornell University in 1912 and was associated for a number of years with the H. W. Caldwell & Son Co. He was vice-president of that company prior to its merger with the Link-Belt Co. He was later assistant to the chairman of the latter company and sales manager for the Chicago plant products. He became general manager of that plant in 1927.

W. C. Carter will have general charge of production at all plants, with headquarters at Chicago. He became identified with the company immediately after his graduation from the University of Illinois and until 1909 was supervisor of the drafting and engineering department at Chicago. Later he became construction engineer, and in 1911, superintendent of the Chicago plant, holding that position until 1926, when he became assistant general manager. He was appointed production manager of the company and its subsidiaries in October, 1927.

—

Guy Hubbard has resigned as associate editor of *Mechanical Engineering*, New York, to become advertising manager of the National Acme Co., machine tool builder, Cleveland. Mr. Hubbard received his technical training at the University of New Hampshire, and began his active association with the machine tool business in 1915 in the shop and drafting room of the Windsor Machine Co., Windsor, Vt. During the war he served in the Ordnance Department of the Army. As a member of the headquarters staff of the American Society of Mechanical Engineers, Mr. Hubbard has been concerned primarily with matters related to machine tools and production. He is a director of the Machine Tool Congress of the National Machine Tool Builders' Association.

GUY HUBBARD

—

James A. Henry has been named general manager of sales, strip steel sheet department, Weirton Steel Co., Weirton, W. Va., succeeding Joseph F. Savage, who recently resigned. Mr. Henry had been assistant general manager of sales since about the middle of last year and previously had been Detroit district sales manager for the Columbia Steel Co. and the Wheeling Steel Corporation. His headquarters will be in Weirton, but he will continue to spend much time in Detroit.

—

H. W. Seymour has been elected a director of Crane Co., Chicago, to succeed L. P. Ordway, resigned. L. B. Peeples has been made a vice-president. Other directors and officers have been reelected.

—

Henry D. Sharpe, Brown & Sharpe Mfg. Co., Providence, R. I., has been reelected president of the Community Fund of Providence.

—

Leonard F. Cowell has been appointed Chicago district manager for the Lamson & Sessions Co., bolt and nut manufacturers, Cleveland, and William M. Olsen has been appointed to fill a similar position in the Detroit territory, the company having opened new district offices in both cities. The Chicago office is at 1016 Straus Building and the Detroit office at 4-228 General Motors Building. Mr. Cowell for 15 years was connected with the sales organization of Kirk-Latty Co., Cleveland, which was absorbed some time ago by the Lamson & Sessions Co. Mr. Olsen was with the Kirk-Latty Co. for 17 years.

E. A. Bayton, who has been in charge of the Detroit sales office of the Lees-Bradner Co., Cleveland, manufacturer of gear-cutting and grinding machinery, has been appointed sales manager of that company.

—

Roy H. Smith has been elected president and treasurer of the Kent Machine Co., Cuyahoga Falls, Ohio, manufacturer of bolt-threading and other machinery.

—

Charles H. Longfield, sales manager of the Lamson & Sessions Co., Cleveland, has been elected a director of that company.

—

Fred J. MacMackin, secretary-treasurer of the Andrews Iron & Steel Corporation, Utica, N. Y., has been made general manager of the company. George W. Andrews continues as president.

—

W. H. Lewis was reelected president of the Pennsylvania Engineering Works, New Castle, Pa., at the annual meeting held recently. Other officers elected are W. S. Wheeler, vice-president and treasurer; S. B. Cleal, secretary, and Lee E. Allen, chief engineer.

—

Roy Cosbey, for four years comptroller of the Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has been elected secretary and a director of the company, succeeding the late Richard J. Dibowski. Before becoming associated with the Wadsworth company, Mr. Cosbey was identified with the Joslin-Schmidt Co., the Cincinnati Milling Machine Co., the Modern Foundry Co., and Ernst & Ernst, all of Cincinnati.

—

M. B. Mathley, for many years representative in the Chicago territory for the Roller-Smith Co., 233 Broadway, New York, has been appointed exclusive sales agent in that territory, succeeding M. Frankel. W. J. Schuhmann, who has been connected with the company's New York office, has been transferred to the works at Bethlehem, Pa. Albert Milmow, Latonia Building, Charlotte, N. C., has been appointed agent for the Roller-Smith Co. in North and South Carolina. S. H. King has been added to the sales force in New York.

—

Harold Ingram has been appointed superintendent of roll shops, Homestead works, Carnegie Steel Co., succeeding W. C. Oberg, recently promoted to superintendent of all roll departments of the company. Mr. Ingram was Mr. Oberg's assistant for several years.

—

Capt. Alby O. Ackard, superintendent of river transportation for the Carnegie Steel Co., Pittsburgh, was appointed commodore of the Carnegie fleet at the annual dinner of the company by James A. Farrell, president of the Steel Corporation, who was the principal guest at the dinner. Captain Ackard was born in Pittsburgh in 1866 and has been with the Carnegie company since 1917, first as captain of the steamer Duquesne and, since 1919, as general superintendent of river transportation.

—

A. M. MacFarland has been added to the staff of the Lincoln Electric Co., Cleveland, as general sales and development engineer. During the early years of the war he was engaged in consulting engineering practice, and later was assigned by the Navy Department to supervise the construction of marine propelling machinery for naval units. After the war he became interested in the design and development of percussive and automatic arc-welding equipment, and during the last seven years obtained about 30 patents in the welding field.

—

John T. Seaver, formerly a partner in the firm of Ridenour, Seaver & Kendig, Cleveland and Pittsburgh, consulting engineers, has formed J. T. Seaver, Inc., Fairmount-Cedar Building, Cleveland, to act as sales agent in the sale of material-handling and other heavy machinery.

—

Henry H. Peck has been appointed district sales manager in New York for the Eagan-Johnson Steel & Iron Co., Crum Lynne, Pa., maker of carbon and alloy steel castings. He will have offices at 114 Liberty Street.

—

William A. Rockenfield, recently general manager of the Baldwin Chain & Mfg. Co., Worcester, Mass., and identified with other manufacturing projects in a consulting capacity, has been appointed vice-president of the High-Speed Hammer Co., Inc., Rochester, N. Y., and will devote his time to engineering and sales.

—

J. F. Naylor was elected president of the Keystone Forging Co., Northumberland, Pa., at a recent meeting of the board. He succeeds J. J. Axilrod, who severed his connection with the company last April. Mr. Naylor has been works manager for the Keystone company for three years and previously was associated with the J. H. Williams Co., at Brooklyn, for 20 years.

—

F. O. Schramm has been appointed assistant general sales manager of the Eastern division of the Pressed Steel Car Co., with headquarters in New York, and F. L. Johnson has been made assistant general sales manager of the Western division, with headquarters in Chicago.

—

C. H. Heist has been appointed general manager of the Mayville Iron Co.'s plant, Mayville, Wis., succeeding J. H. Means, resigned.

John H. Watson, Jr., President of Corrigan, McKinney Steel Co.

John H. Watson, Jr., was elected president of the Corrigan, McKinney Steel Co., Cleveland, at a meeting of the directors Jan. 30 to fill the vacancy caused by the death of J. W. Corrigan. Mr. Watson, an attorney and close friend of Mr. Corrigan, had been secretary of the company. J. E. Ferris, vice-president in charge of finances and treasurer, was elected secretary.

Mr. Watson issued an announcement that the company would continue to be operated as an independent, that the policies of Mr. Corrigan will be followed and that the management of the business and properties will be conducted by the present organization. The announcement stated that the elections were made unanimously by the board on which every stock interest of the company is represented. Mr. Corrigan owned a majority of the stock.

Mr. Watson was named in Mr. Corrigan's will as one of the two trustees of his estate, the other being the Union Trust Co., Cleveland. The trustees are given full control of Mr. Corrigan's interests in the steel company and all associated companies. The only restriction is a provision in the will that none of Mr. Corrigan's stock in the steel company is to be sold during his widow's lifetime without her consent.

The death of Mr. Corrigan was followed by rumors that the company would be merged or purchased by another interest. Cleveland banks are largely interested in the Corrigan, McKinney steel plant by their ownership of preferred stock of the McKinney Steel Holding Co., which is secured by Mr. Corrigan's stock ownership in the original McKinney Steel Co.

Obituary

WILLIAM N. BANCROFT, organizer of the Dibert, Bancroft & Ross Co., Ltd., New Orleans, electric steel foundry, died on his farm near Los Angeles, on Jan. 24. He was 57 years of age.

—

EDWIN M. DRUMMOND, since 1910 president of the Drummond Mfg. Co., 1214 West Main Street, Louisville, Ky., died suddenly on Jan. 22, aged 60 years. He was graduated from the Stevens Institute of Technology, Hoboken, N. J., and immediately became associated with his father in the Drummond company. He was a member of the American Society of Mechanical Engineers and of the Engineers and Architects Club of Louisville.

URGES STUDY OF SELLING

Eugene G. Grace Says Distribution Problem Is Present-Day Challenge to Engineers

THE steel industry of Pittsburgh paid a great compliment to Eugene G. Grace, president Bethlehem Steel Corporation, in heavy representation at the forty-seventh annual banquet of the Engineers Society of Western Pennsylvania at the William Penn Hotel, Pittsburgh, Jan. 30, at which Mr. Grace was the principal speaker. The attendance reached a total of fully 1400 and the presence of men prominent in the steel industry gave the gathering a character similar to that of meetings of the American Iron and Steel Institute. None of the steel companies of the district was unrepresented.

Taylor Allderdice, president National Tube Co., was toastmaster, and William G. Clyde, president Carnegie Steel Co., was at the speakers' table, while T. M. Girdler, president Jones & Laughlin Steel Corporation, also was in the assemblage.

Mr. Grace, taking as examples the late Gen. George W. Goethals, W. W. Atterbury, Herbert Hoover, John Hays Hammond and Charles M. Schwab, drew an interesting picture of the characteristics of these men that had made them leaders of industry as well as of the engineering profession with which they were affiliated. His remarks were in part as follows:

In the careers of the men to whom I have referred we find typified the development of the chief problems of engineering. The first is to shape and direct the forces of nature and thus to bring the world's resources to add to the comfort and welfare of mankind. That, in a word, is the problem of production. Engineers have made a supreme contribution to the solution of that problem. But I feel that we have two somewhat newer branches of engineering which must command more and more of our attention. Those are what might be termed commercial and human engineering. Of what value is all our efficiency in production if we do not distribute efficiently, economically and effectively? And of what value is any of it unless we can add to the happiness and deeper satisfaction of those engaged in industry, as well as those who enjoy its products?

I predict that the outstanding advances in business over the next 10 years will be in improved merchandising and distributing methods. Herein lies a wide field of opportunity for the engineer.

E. H. H. Simmons, president of the New York Stock Exchange, told of the machinery of that organization and the part it had played in the upbuilding of industry in affording a means whereby the shares and bonds of American companies could be sold to the investing public. He defended speculation and the speculative investor, saying that when the securities of a new industry appeared there was only the speculative investor to take them, since the permanent investor was timid and not disposed to tie up funds in securities about which there was any doubt as to dividends. He paid a tribute to the frank publicity policy of the Steel Corporation in matters of corporate information and especially its quarterly report of the number of shares held by banks and brokerage firms and those in the names of individuals. In 20 years holdings of Steel Corporation common stock have changed from one-third in the hands of the public and two-thirds in banking and brokerage names to 80 per cent in individual names and the remainder in speculative accounts.

Wright Company Gets Large Government Order

WASHINGTON, Jan. 31.—The Navy Department has awarded a contract for the construction of 100 nine-cylinder air-cooled aircraft engines, with spare parts, to the Wright Aeronautical Corporation, Paterson, N. J. The engines will be installed in 25 new coast patrol planes being built by the Douglas Co., Santa Monica, Cal. Each plane will carry two engines and the remainder of the order will be used as spares.

Grinding Machinery Makers Consolidate

The Wilmarth & Morman Co., Grand Rapids, Mich., manufacturer of grinding machinery, has consolidated with the Covel-Hanchett Co., Big Rapids, Mich., maker of grinding and saw and knife-fitting machinery. Prior to Jan. 1, the latter company was known as the Machinery Co. of America. It operates plants at Big Rapids and Benton Harbor, Mich. The Grand Rapids office of the Wilmarth & Morman Co. will be discontinued and the company will operate as a division of the Covel-Hanchett Co.

Russian Railroad Delegation Places Orders for Equipment

Purchases of railroad-building equipment are being made in the United States by a delegation of railroad men from Soviet Russia, according to an announcement by S. M. Ivanoff, chairman of the delegation, at the office of the Amtorg Trading Corporation, 165 Broadway, New York. Its first purchases consisted of steam shovels, gas locomotives, drilling supplies and a number of automobiles. Equipment is being bought for the new Turkestan-Siberian Railroad, which, Mr. Ivanoff announced, will cost about $110,000,000 to build, including rolling stock. The road, about 900 miles long, will extend from the sub-tropical region of Soviet Turkestan to southern Siberia and will shorten by two-thirds the distance between Tashkent, the center of Turkestan, to Novosibirsk, the capital of Siberia. Considerable additional equipment will be bought after the delegation has visited plants in this country making such equipment. The delegation will also make a study of the New York Central, Baltimore & Ohio and Northern Pacific railroads.

Pacific Coast Fabricating Plants Are Merged

The steel fabricating, crane and bolt and rivet departments of the Judson Mfg. Co., Emeryville, Cal., and the Pacific Rolling Mill Co., San Francisco, steel fabricator, have merged and will be operated under the name of the Judson-Pacific Co. The Judson Mfg. Co. was organized in 1882 and for many years has operated open-hearth furnaces, rolling mills and a fabricating plant and will continue to operate the steel-making departments. The Pacific Rolling Mill Co. was organized in 1868 and at first rolled bars from pile scrap. It was the first company on the Pacific Coast to install an open-hearth furnace. In 1897 it began operating as a fabricating plant only.

The Judson-Pacific Co. has been incorporated in Nevada with physical assets of $1,500,000. Officers are: Carlos J. Maas, president; E. B. Noble, vice-president and treasurer; A. E. Wilkens, vice-president and general manager; Paul F. Gillespie, vice-president in charge of sales. The combined capacity of the fabricating plants at San Francisco and Emeryville is 25,000 tons a year.

McClintic-Marshall Co. Buys Steel Fabricating Plant on Pacific Coast

The McClintic-Marshall Co. has purchased the Central Iron Works, San Francisco, and will operate the plant under the name of the McClintic-Marshall Co. Central Works. The Central Iron Works was organized by A. A. Devoto in 1900 and is one of the important steel fabricating plants on the Pacific Coast. Mr. Devoto will be general manager; A. B. Charlton, manager of works, and Harry Mortenson, formerly of the Mortenson Construction Co., San Francisco, secretary. This gives the McClintic-Marshall Co. two plants on the Coast, one in Los Angeles.

Higher Prices in European Markets

Particularly on Continent, Stiffer Prices Accompany Swedish Strike—Tin Plate Weakness Expected

(*By Cable*)

LONDON, ENGLAND, Jan. 30.

THERE has been improved demand for Cleveland pig iron since consumers have realized that makers are unlikely to reduce prices in view of the stiffening of Continental quotations. Considerable activity was noticeable last week including the covering of requirements on contracts up to June.

Export business is still quiet. East coast hematite is dull and as stocks are large makers are keen sellers. The North Lonsdale Iron & Steel Co. has blown out its remaining Ulverston blast furnace. Durham coke prices have stiffened as a result of increased export sales. Foreign ore is quiet.

A strike at Swedish iron ore mines may affect the market by forcing German consumers to purchase North African and French ores. Finished iron and steel are quiet generally and plate mills are seeking orders. Several more shipbuilding contracts have been placed and domestic mills are seeking the orders for the steel material involved.

Tin plate is quiet. Although inquiry is moderate, consumers are expecting lower prices. Most works, however, are still due to complete their compulsory three weeks suspension and the association has agreed to prolong the plan and will require the closing of works for an additional three weeks during the period beginning March 1.

Galvanized sheets are moderately active. Bombay has bought some fair tonnages and Calcutta is inquiring. Prices are firm. There is a good demand from Japan for No. 28 gage black sheets and there have been some small sales of thin gage sheets. No. 24 gage black sheets are generally quiet and makers are accepting lower prices.

The Continental market is strong as a result of improved export business, establishment of French sales offices for semi-finished material and beams and the strike in the Swedish ore fields. The North British Locomotive Co. has secured a contract for 29 locomotives for South Africa and the same railroad has awarded 10 locomotives to Italian makers.

FRENCH PRICES IRREGULAR

Domestic Buyers Evidently Well Stocked—Export Trade Quiet—British Pig Iron Competitive

PARIS, FRANCE, Jan. 13.—Despite the good prospects for increased business at the beginning of the year, the market has been steadily growing quieter and there is a tendency toward weakness in prices. Revival of the comptoir for heavy rolled products is expected to bring about more firmness, but until there is a genuine reduction of stocks held by consumers and the franc is legally stabilized a lasting revival of business is not anticipated. Another unfavorable factor in the situation is the high cost of production, caused in part by the heavy taxes borne by industry, the prospect of increased freight rates and the probability of revised laws on workers' insurance. Export trade is quiet, and prices have developed a slight downward tendency.

Pig Iron.—Purchasing of phosphoric foundry iron by domestic users has been declining since the first of the month. Nevertheless producers have increased the tonnage available for domestic consumption in January from 30,000 to 33,000 tons. Hematite is moving in moderate tonnages as negotiations for the formation of an international syndicate continue. An advance in foundry iron prices is expected in some quarters, but there are also reports that coke may decline, which would justify a reduction in pig iron prices. Competition for foreign trade is keen, particularly from British furnaces, which are still quoting low prices on foundry and hematite iron.

Semi-Finished Material.—Export business is limited to a few small tonnages of billets and blooms, but demand for sheet bars has shown slight improvement. Blooms are quoted at £3 17s. 6d. to £4 2s. ($18.88 to $19.97) per ton. Billets are nominally £4 3s. 6d. to £4 7s. 6d. ($20.33 to $21.31) per ton, f.o.b. Antwerp.

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.87 per £ as follows:

Durham coke, del'd.	£0	17½s.	to	£0	17¾s.	$4.27	to	$4.33
Bilbao Rubio ore*	1	0½	to	1	1	4.99	to	5.11
Cleveland No. 1 fdy.	3	7½				16.44		
Cleveland No. 3 fdy.	3	5				15.83		
Cleveland No. 4 fdy.	3	4				15.59		
Cleveland No. 4 forge	3	3½				15.46		
Cleveland basic (nom.)	3	15	to	3	15½	18.27	to	18.39
East Coast mixed	3	8	to	3	10	16.56	to	17.05
East Coast hematite	3	8½	to	3	10½	16.68	to	17.17
Rails, 60 lb. and up.	7	15	to	8	0	37.75	to	38.96
Billets	6	0	to	6	10	29.22	to	31.66
Ferromanganese	13	10				65.75		
Ferromanganese (export)	13	0	to	13	5	63.31	to	64.53
Sheet and tin plate bars, Welsh	5	7½	to	5	15	26.18	to	28.01
Tin plate, base box.	0	18	to	0	18¼	4.39	to	4.45
Black sheets, Japanese specifications.	13	5	to	13	10	64.53	to	65.75
						C. per Lb.		
Ship plates	7	12½	to	8	2½	1.66	to	1.77
Boiler plates	10	10	to	11	0	2.28	to	2.39
Tees	8	2½	to	8	12½	1.77	to	1.99
Channels	7	7½	to	7	17½	1.60	to	1.71
Beams	7	2½	to	7	12½	1.55	to	1.66
Round bars, ¾ to 3 in.	7	5	to	7	15	1.58	to	1.69
Steel hoops	10	10	to	11	0	2.28	to	2.39
Black sheets, 24 gage	9	15	to	10	0	2.12	to	2.17
Galv. sheets, 24 gage	13	0	to	13	5	2.82	to	2.88
Cold rolled steel strip, 20 gage, nom.	14	0	to	14	5	3.04	to	3.10

*Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Per Metric Ton)

Foundry pig iron: (a)								
Belgium	£3	2s.				$15.10		
France	3	2				15.10		
Luxemburg	3	2				15.10		
Basic pig iron (nom.):								
Belgium	2	19				14.38		
France	2	19				14.38		
Luxemburg	2	19				14.38		
Coke	0	18				4.39		
Billets:								
Belgium	4	7	to	£4	9s.	21.19	to	$21.68
France	4	7	to	4	9	21.19	to	21.68
Merchant bars:						C. per Lb.		
Belgium	5	0				1.10		
France	5	0				1.10		
Luxemburg	5	0				1.10		
Joists (beams):								
Belgium	4	8	to	4	10	0.97	to	0.99
France	4	8	to	4	10	0.97	to	0.99
Luxemburg	4	8	to	4	10	0.97	to	0.99
Angles:								
Belgium	4	17½				1.08		
⅛-in. plates:								
Belgium (a)	6	4	to	6	5	1.37	to	1.38
Germany (a)	6	4	to	6	5	1.37	to	1.38
⅜-in. ship plates:								
Belgium	5	19	to	6	0	1.32	to	1.33
Luxemburg	5	19	to	6	0	1.32	to	1.33
Sheets, heavy:								
Belgium	6	1				1.34		
Germany	6	1				1.34		

(a) Nominal.

Sheet bars are quoted at £4 7s. to £4 8s. 6d. ($21.19 to $21.55) per ton, f.o.b. Antwerp.

Finished Material.—Reports that negotiations for the formation of a comptoir controlling heavy rolled products had been successful immediately affected the market. Prices began to advance and soon afterward demand declined, as consumers evidently had sufficient stocks. In consequence, prices have become irregular, although mills are not seeking tonnage for prolonged delivery, expecting a reaction upward when the comptoir is actually formed. Beams are quiet at £4 7s. to £4 7s. 6d. (0.96c. to 0.97c. per lb.), and quotations on merchant bars are easier at £4 16s. 6d. to £4 17s. 6d. per ton (1.06c. to 1.07c. per lb.), f.o.b. Antwerp. Demand for wire rods is good, and an advance in prices by the Wire Rod Syndicate has been expected but has not yet developed. Mills producing hot-rolled hoops are heavily engaged with tonnage booked in the past few weeks. First quarter prices on rails have not yet been established. The export statistics of the Government on rails are being studied by the rail comptoir, which points out that fully 40 per cent of total exports was made up of relaying rails sold by the railroads and scrap rails exported by dealers in old material and so classified to avoid coming under the scrap export quota. Prices of light and heavy gage sheets are unsteady, but medium gages still show a slight tendency to advance in the domestic market. For export, sheet prices are unchanged.

GERMAN PRICES ADVANCED

Added Cost of 8-Hr. Day Brings Increase—Unemployment Insurance a Burden—Mills Busy

BERLIN, GERMANY, Jan. 13.—The expected advance in domestic steel prices was made effective Jan. 12. It is the first general revision of domestic prices since the formation of the Ingot Steel Syndicate in 1925. The reason for the advance was a reduction by Governmental order of the working day from 10 to 8 hr. without an accompanying reduction in wages. The increase in prices is much smaller than had been expected, advances of from 10 to 20 per cent having been predicted in some quarters. The conservative character of the price revision was probably due to current evidence that business is beginning to decline. Railroad car loadings have been considerably smaller recently, and the latest report on unemployment shows a total of 1,046,000 out of work, compared with 450,000 in October, 1927. The total, however, was smaller than in the corresponding week in 1927, which showed 1,748,000 unemployed.

Actual advances are limited to certain products. Steel bars and shapes are up 3 m. (72c.) per ton. Price rebates granted by mills in Westphalia to consumers in southern Germany to offset higher freight rates have been reduced from 6 m. ($1.43) to 4 m. (95c.) per metric ton. Thus, structural shapes of Thomas steel are now 134 m. ($31.92) per ton, f.o.b. Oberhausen, instead of 131 m. ($31.20) per ton, and steel bars are 137 m. ($32.63) per ton, f.o.b. Oberhausen, instead of 134 m. ($31.92) per metric ton.

Prices Still Low

These advances in prices are not expected to afford much aid to French and Belgian exporters to Germany, and no objections are looked for from German manufacturers producing chiefly for export. The increased difference between German domestic and world market prices has been adjusted, as in the past, by advances in the rebates paid by the steel syndicate to exporting manufacturers.

In announcing the revision of prices, producers have pointed out that, although steel prices based on an index of 100 in 1914 are only 124.4, the general price index in Germany is about 140. The index for production machinery is 133.9, and for coal, 130.7.

The threat of a strike in the steel industry or suspension of the mills as a result of the 8-hr. day controversy has finally passed. But steel mills, as well as manufacturers in other branches of industry, complain that the new system of unemployment insurance is unsatisfactory. Pay for unemployment is based on the average wages earned in the three months preceding unemployment. As a result, it is claimed, men who have been drawing high wages and are unemployed because their work is seasonal prefer drawing unemployment pay to accepting work in some other branch of industry at a lower wage. It is also contended that contributions to the insurance funds are a heavy burden on industry.

Steel Mills Well Booked

Conditions are still good throughout the steel industry, and, according to the ministry of trade, there had been no appreciable reduction in the prosperity of the country on the first of the current month. Producers of various products have orders booked ahead for about the following periods: producers of pig iron, three months; producers of steel ingots, two and a half months, and of semi-finished products, three months; rail mills, one to one and a half months; structural mills, one and a half months; bar mills, three months, and sheet mills, one to two months. Orders are still being booked in satisfactory volume.

Ship yards are not so well engaged as they were last summer. The total capacity of all yards is about 1,000,000 tons of shipping. Current contracts are for something less than 500,000 tons, compared with the summer total of close to 700,000 tons.

Mills in the Ruhr are preparing to negotiate with Russian oil monopolies for the delivery of line pipe and other oil field materials, as well as the aid of German technical men.

German Mills to Offer Special Products Here

HAMBURG, GERMANY, Jan. 14.—Following the decision of the United States Treasury Department that German steel is not being dumped in the United States, mills here have been endeavoring to regain some of the trade with American consumers that was lost to French, Belgian and Luxemburg mills while the dumping question was under investigation.

German mills are evidently inclined to abandon the business in structural shapes and bars to the French and Belgian mills, as competition is extremely severe. Their activity is, therefore, directed toward increasing sales of seamless tubes, sheets, hoops and other high-grade products.

Swedish Ore Interest Controls French and African Mines

STOCKHOLM, SWEDEN, Jan. 12.—Formation of the Aktiebolag Hematit Stockholm, a new iron ore company, has attracted considerable attention. It is a subsidiary of the Grangesberg Oxelosung Aktiebolag, the largest producer of ore in Sweden. The new company has purchased Dutch and British interests in certain North African iron ore mines and more recently bought a majority interest in leading French iron ore companies.

German Decision Extends Time on Machinery Claims

HAMBURG, GERMANY, Jan. 14.—A recent decision of the Supreme Court on claims in the machinery trade is of considerable importance to foreign sellers of machinery to German users. The decision of the court was that claims as to the quality of a machine should be made within one week of putting the machine in operation and not, as has been the practice in the past, two weeks after receipt of the machine. This leaves the time when a claim may be presented indeterminate, as a machine may not be placed in actual operation for some time after it is received.

LEAD AND ZINC IN 1927

Output of Zinc Decreased While That of Lead Increased Slightly

THE output of primary domestic desilverized lead in 1927 was about 375,000 tons; of soft lead about 240,000 tons, and of desilverized soft lead about 61,000 tons, making a total output from domestic ores of about 676,000 tons of refined lead, according to statistics compiled by the United States Bureau of Mines. Corresponding figures in 1926 were 366,413 tons of desilverized lead, 258,565 tons of soft lead, and 55,707 tons of desilverized soft lead, making a total of 680,685 tons. The output of lead smelted and refined from foreign ore and bullion was about 131,000 tons, as compared with 118,256 tons in 1926.

The total primary lead smelted or refined in the United States in 1927 was thus about 807,000 tons, as compared with a total of 798,941 tons in 1926—a gain of about 1 per cent. The output of antimonial lead in 1927 was about 16,000 tons, as compared with 22,524 tons in 1926.

Imports of refined pig lead for 11 months amounted to 2442 tons, of which 1764 tons came from Mexico. Exports of lead of foreign origin amounted to 111,835 tons, as compared with 67,660 tons exported in the entire year 1926. Exports of lead of domestic origin amounted to 2233 tons, as compared with 4276 tons exported in 1926. Exclusive of stocks of lead at smelters and refineries, and estimating the amount of lead exported with benefit of drawback, for which figures are not available, it is calculated that the new supply of lead made available for consumption in 1927 was about 685,000 tons, as compared with 717,653 tons in 1926.

Less Zinc Last Year

Output of primary metallic zinc from domestic ores in 1927 was about 575,000 tons and that from foreign ores was about 13,000 tons, a total of 588,000 tons, as compared with 611,991 tons from domestic ores and 6431 tons from foreign ores, a total of 618,422 tons in 1926. In addition to the output of primary zinc, there was an output of about 45,000 tons of redistilled secondary zinc, as compared with 40,799 tons in 1926, making a total supply of distilled and electrolytic zinc in 1927 of about 633,000 tons, composed of 192,000 tons of high-grade and intermediate, 71,000 tons of select and brass special, and 370,000 tons of prime Western zinc.

Imports of slab zinc for 11 months amounted to only 24 tons. The exports of slab zinc made from domestic and foreign ores amounted to 48,273 tons, including 3625 tons of rolled zinc. The apparent consumption of primary zinc in 1927 was about 522,000 tons, as compared with 557,026 tons in 1926.

The total number of retorts at the 24 zinc smelters that operated during all or a part of the year was about 120,000. Of that number about 73,000 were reported in operation at the end of November and about 73,000 were expected to be in operation at the end of the year. At the end of 1926 there were 89,496 retorts in operation at these 24 plants.

MANGANESE ORES IN 1927

Domestic High-Grade Ore Output Declines Again—Larger Manganiferous Ore Shipments

DOMESTIC shipments of manganese ore containing 35 per cent and more of metallic manganese totaled in 1927 approximately 43,600 gross tons, valued at $1,142,000, according to preliminary figures compiled by the United States Bureau of Mines. This is a decrease of 6 per cent from the 1926 shipments of 46,258 tons. A decrease in average value per ton of all ore shipped in 1927 is due in part to the decreased world's price of metallurgical ore and also to the decreased shipments of chemical ore in comparison with those of metallurgical ore. The shipments of metallurgical ore amounted to 26,000 tons, valued at $416,000, while those of 1926 were 26,530 tons, valued at $379,893. The shipments of chemical ore in 1927 amounted to 17,600 tons, valued at $726,000, while those of 1926, were 19,728 tons, valued at $848,770.

The quoted price of high-grade manganese ore in 1927 decreased materially in the latter part of the year. Quotations for foreign ore, crude, have been approximately 33c. per unit, whereas the average price of 1926, Atlantic seaboard, was 39c. per unit.

Ore Imports Declined

Figures furnished by the Bureau of Foreign and Domestic Commerce show that during the first 11 months of 1927 the metallic content of imported ore was 276,823 tons. The gross tonnage of ore was 554,382 tons. This includes importation from Cuba. Assuming that the imports for December were at the same rate as during the first 11 months, the total ore importation was approximately 605,000 tons as compared with the total imports of 738,000 tons in 1926. The decrease in imports is attributed in the main to the decreased manufacture of steel during the year, and possibly to the draft on stocks in the hands of consumers.

Manganiferous Iron Ore Shipments Large

Shipments of domestic ore containing from 10 to 35 per cent of manganese (ferruginous manganese ore) in 1927 were 134,000 tons, valued at approximately $609,000, as compared with 364,312 tons, valued at $1,179,429, in 1926. The domestic shipments of ore containing from 5 to 10 per cent of manganese (manganiferous iron ore) in 1927 were 1,317,000 tons, valued at $3,306,000, as compared with 835,412 tons, valued at $1,934,381, in 1926. The changes indicated are largely explained by the fact that much of the output in Michigan and Minnesota averages about 10 per cent, being classified in some years as ferruginous manganese ore, in other years as manganiferous iron ore. A large quantity of manganiferous iron ore produced in Wisconsin in 1927 containing slightly more than 5 per cent manganese is included in the above figures, whereas the corresponding output in 1926 fell below this grade and has not been included because classed as iron ore.

The apparent outstanding features of the year have been the increase in the domestic manufacture of spiegeleisen and the increased production and consumption, relative to the production of steel, of ores having a low metallic manganese content. While the combined production of ferruginous manganese and manganiferous iron ores in 1927 differs but slightly from the production of 1926, the gross tonnage of steel produced decreased.

Canadian Pig Iron Output Showed Seven Per Cent Loss in 1927

"Tonnage of pig iron produced in Canada during 1927, amounting to 709,697 gross tons, was 7 per cent lower than in the previous year, but the output of steel showed considerable improvement at 907,638 tons, compared with 776,888 tons in 1926," says the report of the Dominion Bureau of Statistics.

"The gain in steel production was due mainly to the increase in tonnage required for rails and other railroad equipment, and to a better demand from the construction, machinery and agricultural implement industries. The decline in pig iron production must have been accompanied by a depletion of stocks on hand at the various works, since the bulk of the pig iron made in Canada goes into the manufacture of steel, and the aggregate output of steel was up 17 per cent. Imports of pig iron showed an increase to 45,833 net tons (40,922 gross tons) from 29,246 net tons (26,112 gross tons)."

For the month of December the production of pig iron in Canada amounted to 63,197 gross tons, an increase of 66 per cent over the 37,989 tons of November and 17 per cent over the 53,971 tons made in December of a year ago.

SHIPBUILDING SHOWS GAIN

Increase of Nearly 39 Per Cent in 1927—England Far in the Lead

WORLD production of merchant vessels increased sharply during 1927, launchings for the year aggregating over 600,000 gross tons more than for 1926, according to Lloyd's Register of Shipping. Last year's total of 2,285,000 gross tons was the largest recorded since 1922. But the figure is still over a million tons less than that for the last pre-war year, 1913; and is nearly 5,000,000 tons below the peak year of 1919.

While launchings in the United States showed a gain of about 20 per cent last year, as compared with 1926, the increase for Great Britain and Ireland during the same period was over 90 per cent. On the other hand, the 1927 total for all other maritime countries combined showed a slight decline from the 1926 figure. The relative position of these groups is shown in the table, giving the gross tonnage of ships launched:

	1927	1926
United States	179,218	150,613
Great Britain and Ireland	1,225,873	639,568
Other countries	880,588	884,796
World total	2,285,679	1,674,977

Economic Survey, Sponsored by Secretary Hoover, to Be Made

WASHINGTON, Jan. 31.—Far-reaching inquiry into the changes in economic currents is to be instituted by Secretary of Commerce Herbert Hoover, who has appointed a committee of leading business men and economists to supervise the work. Their names will be announced late. Private individuals have subscribed money to pay the expenses of the Bureau of Economic Research of New York in making the fact-finding background. The cooperation of the Department of Commerce will be given. It is proposed to determine the facts with regard to such questions as the shifts in employment, changes in methods of production and distribution, in industry and agriculture, shifts in relative price levels and profits, movements in the business cycle and other allied subjects which bear upon the general business situation. It is expected that the inquiry will take several months. Five years ago a similar survey was made under similar auspices.

Commodity Price Movements Present Confused Picture of Future

Business trends as reflected in wholesale commodity and retail price movements, volume of employment and wage earnings at the present moment present a confused picture and do not indicate what may be expected in the immediate future in way of business recovery, according to the National Industrial Conference Board, 247 Park Avenue, New York.

While underlying conditions are appraised as sound by the Conference Board, it is pointed out that living costs based on retail prices of the necessities of life, which in the past have tended to follow the trend of wholesale commodity prices with a lag of only a few months, as yet have shown no signs of rising; wholesale prices have shown an upward trend since April, 1927. In the view of the board, inasmuch as final consumption determines the permanence of production, the failure of retail prices thus far to reflect a stiffening of demand for goods leaves it at the present an uncertainty whether or not the upward turn of wholesale commodity prices during the past eight months is of a permanent character and actually reflects an increased demand for materials such as would foreshadow increasing industrial activity.

The volume of employment in industry has been definitely on the downward trend since July, 1920, and at the close of 1927 was approximately 20 per cent less than at the peak in 1920. Most of this decline, however, took place during a period of increasing industrial production and is known to have been due largely to increased mechanization of industry. There are no statistics available indicating to what extent the thus created labor reserve has found employment in other occupations, or to what extent it has been offset by immigration restriction. But it is significant, the board points out, that despite the decline in the volume of employment wage earnings of those employed in industry have shown marked stability at a high level which, during 1925, 1926 and 1927, averaged 116 per cent higher than in July, 1914. This, the board concludes, does not reflect pressure by an increasing labor reserve on the employment market.

Simplified Practice Results in Large Saving to Industry

WASHINGTON, Jan. 31.—Growth of simplified practice in industry is shown in a report issued by Ray M. Hudson, assistant director Bureau of Standards, in reviewing the 1927 activities of the commercial standards group of the bureau. There were completed during the year 18 new simplified practice recommendations, bringing the total projects completed to 80.

That simplification yields benefits sufficient to attract manufacturers, distributers and consumers alike, says Mr. Hudson, is demonstrated in the high degree of adherence shown by recent reviews of 15 of the simplified practice recommendations already promulgated. The report shows that accepters representing an average of 82.61 per cent of the total volume of the industry affected are following the simplified practice schedules. Further evidence that simplification is proving of great value to manufacturers and purchasers, it is pointed out, is found in the increased number of associations accepting the completed recommendations. The list of association indorsers grew from 686 to 868 during the year, the individual concerns from 2775 to 6676.

Among other experiences cited in connection with this form of waste elimination are those pertaining to a metal lath manufacturer, who reported a reduction of $140,000 in his inventory, and a manufacturer of eaves trough and conductor pipe, who reported a $30,000 reduction in his inventory. A manufacturer of die head chasers reported a 20 per cent reduction in his inventory, while another reported a reduction of 65 per cent.

Mr. Hudson reports that in eight of the 80 simplifications savings are estimated by leaders of the affected industries to be around $300,000,000 annually, of which $250,000,000 is said to be saved in the softwood lumber industry. Among the estimates are the following:

	Reductions From	Reductions To	Estimated Annual Saving
Die head chasers....	*100	*25	500,000
Die head chasers....	*100	*25	500,000
Sheet steel.....	1819	263	2,400,000
Reinforcing bars....	40	11	4,500,000
Range boilers.....	130	13	5,500,000

*Per cent.

Russian Iron and Steel Output in November

HAMBURG, GERMANY, Jan. 14.—Production of iron and steel by the Union of Soviet Socialist Republics in November, 1927, was 251,944 metric tons of pig iron and 331,400 tons of steel ingots. There were 57 blast furnaces in operation and 169 open-hearth furnaces. The output of finished products totaled 253,941 metric tons. Iron ore production in November was 308,432 tons, and manganese ore output, 63,554 tons.

Classified listing of Canadian automotive, electrical, hardware, radio, machinery, iron and steel, and other manufacturers is contained in the tenth annual edition of Fraser's Metal Products Directory, published recently by the Fraser Publishing Co., Montreal. Included are statistics on manufactured products in Canada, showing their 1927 value to have been $3,000,000,000. Iron and steel products accounted for $500,000,000.

RUST CHECKS RUSTING

Corrosion-Resisting Metals Develop Impervious Protective Coating Automatically

AT a meeting of the Compressed Gas Association, held in New York, Jan. 23, C. E. MacQuigg, of Union Carbide and Carbon Research Laboratories, Long Island City, N. Y., exhibited a unique model showing clearly the mechanism of corrosion according to the electrolytic theory. It consisted of a bank of about 250 flashlight globes, each located immediately behind a small hole in a cardboard screen. These globes were of different colors and properly wired to a four-step flashing mechanism and lead storage battery so that, when in operation, a shower of green sparks, representing hydrogen ions, fell out of a portion of the screen, corresponding to the solution, toward the bottom, representing a piece of iron. Here they met another shower of white sparks indicating electrons flowing along the iron bar, and were mutually extinguished. Similarly, streams of other colored sparks denoted the flow of hydroxyl ions from the solution, iron atoms from the bar, oxygen from the air, and the precipitation of iron hydrate.

Extracts from Mr. MacQuigg's paper, "Notes on the Corrosion of Metal," follow:

We are apt to think of metals as being insoluble, and so they are, relatively. Generally speaking, we should think of them more properly as being quite ready to go into solution—sometimes very rapidly, as when in a strong acid—at other times very slowly, as when in pure water. When the rate of solution is so gradual that a long time is required for its effect to be noticed and the products remain on the metal, then we speak of corrosion as having taken place.

The rate of solution may differ with the same metal in different solutions, and it is also different for the various metals with the same solution. This latter tendency is called the "electro-potential" of the metal for a given solution. It is a measure of the relative strength of the force which tends to send electrically charged atoms (the so-called ions) of the metal into the solution. The greatest such tendency would exist for manganese, and in a lessening scale others would appear in the following order: zinc, ferrous iron, nickel, lead, tin, ferric iron, copper, silver, platinum, gold. Gold is the lowest and therefore would tend to go into solution (i. e., "corrode") the least of all these metals in this particular environment.

Protective Films

There is, however, another factor which tends to prevent corrosion in some metals: a condition developed at the surface which arrests all further corrosion. In other words, a protective film is formed on the surface of such metals, and this automatically brings to an end the corroding action when it is continuous and self-renewing. Examples of such are found in aluminum and the stainless steels or rustless irons which contain chromium, nickel, cobalt or silicon. These metals actually do have a marked tendency to go into solution (witness their positions in the electro-potential lists), but in a great many environments the products of the chemical action are deposited on the surface of the metal and are so amazingly effective in sealing off further action that a bright metal surface will remain so indefinitely.

A large number of factors come into the complex reactions of corrosion which are so simplified in the electrolytic theory. Some of these are not clearly understood as yet, and others, while clearly recognized, cannot be evaluated in any given instance because of lack of sufficient information. For instance, it is known that most metals, even in the worked condition, are somewhat porous, that is, they have numerous minute or even submicroscopic pores which go from the surface down into the interior of the metal. These pores will generally act to hasten or stimulate corrosion because they tend to give rise to so-called concentration cells, or local pockets in the corroding medium where the chemical concentration is sufficiently different from that over the general surface of the metal to give rise to a most marked speeding up in corrosion. Such pitting may result in perforations looking as though the metal had been drilled by a tool. This teaches us to avoid laminations or crevices where corrosion may be stimulated.

Protecting Films Must Be Insoluble in Corroding Medium

Protecting films do not always protect. For instance, dilute alkalies do not attack iron, but concentrated alkalies do, since the latter have the power of dissolving the protective coating of oxide which tends to form. Similarly, the protective coating formed by the action of an oxidizing agent on chromium alloys is lacking when the corroding medium is hydrochloric acid; the metal is then rapidly attacked.

With the generally accepted theory of corrosion in mind it is of interest to know what has and can be done to combat corrosion.

There is, first of all, the time-honored method of surface protection; a good example would be the covering of steel by concrete. Coating metal by metal is widely used; sometimes merely by a dipping process, as in galvanizing and tinning. Other protective coatings are put on by means of electroplating, examples being nickel, chromium, silver and cadmium. Instances of the protective value of an oxide coating are found in Parkerizing, calorizing, bluing, Sherardizing, browning and the manufacturing of so-called Russia iron.

The second method of protection has been developed in quite recent years through the use of the chromium and chromium-nickel alloys, which has been growing in a remarkable way. These automatically develop a resistance against any given medium of attack through changes which take place on the surface of the metal itself—a corrodible metal becomes rustless by the very act of rusting. This method is of such importance that, contrary to the assumptions made a few years ago, that extreme purity of metal must be found in order to minimize corrosion, we shall probably swing to the other extreme and develop a very specialized technique in which corrosion resistance will be obtained through alloying.

Dunbar No. 1 Furnace Being Scrapped; Iron Making Site for 138 Years

The Dunbar Corporation, Dunbar, Pa., formerly the American Manganese Mfg. Co., which dismantled its No. 2 furnace late last year, has started to tear down the remaining, or No. 1, furnace. This is the seventh merchant furnace in western Pennsylvania to be scrapped in the past five years. At the beginning of 1923 there were 24 merchant furnaces in western Pennsylvania and the Mahoning and Shenango valleys. In that year the Shenango Furnace Co., Sharpsville, Pa., dismantled its No. 4 furnace, and since then the following stacks have been scrapped: Rebecca furnace, Kittanning Iron & Steel Mfg. Co., Kittanning, Pa.; Alice furnace, Valley Mould & Iron Corporation, Sharpsville, Pa.; Ella furnace, Reliance Coke & Furnace Co., West Middlesex, Pa.; No. 2 furnace, Dunbar Corporation, Dunbar, Pa.; Clinton furnace, Clinton Iron & Steel Co., Pittsburgh, and now No. 1 Dunbar furnace. Of the 17 furnaces still standing only four are in operation.

The passing of No. 1 Dunbar furnace brings to an end an enterprise that was started 138 years ago, as this furnace was the direct successor, and occupied the site, of the second blast furnace built west of the Alleghanies, a stone furnace built in 1790. This stack, known as the Union furnace, was built by Col. Isaac Meason, and was first operated in March 1791. The first furnace, several times rebuilt of stone, gave way in 1870 to an iron-shelled furnace. The furnace now being dismantled was built in 1920.

The American Railway Tool Foreman's Association has changed the dates of its 1928 convention to Sept. 12, 13 and 14. Meetings will be held at the Hotel Sherman, Chicago. F. A. Armstrong, of the Pratt & Whitney Co., 564 West Monroe Street, Chicago, is secretary.

Price Cutting Threatens Prosperity

(*Concluded from page* 341)

an antagonist, and have pointed out to him the importance to the jobbing industry of a stabilized market not only in our line, but in all other lines he handles.

This plan has been responsible for the creation of the greatest piece of machinery ever put together in the history of the jobbing industry—a piece of machinery which is now in operation in our line and ready and willing to be effective in all other lines of trade which sell either part or all of their product through the hardware jobbing channels.

We have caused to be created 32 jobbers' committees, each headed by an important executive as chairman, each committee covering a particular section and each committee representing all of the jobbing interests of its particular section; therefore, we have 32 committees with 32 chairmen representing the entire jobbing industry of the country as a whole.

This gives an opportunity for cooperative effort in the jobbing industry never before possible and represents collectively a buying power of approximately a billion dollars per year, and such buying power used on a proper basis in an endeavor to stabilize purchases has untold possibilities.

They have had the fact presented to them in as forcible a manner as possible that the radical price cutter in any line is their greatest enemy, and they will do more to stamp out this evil than any other piece of machinery ever created.

They realize the radical price cutter is an enemy not only to themselves in creating liabilities for them where a stabilized prize creates assets, but he is also an enemy to their community, to their source of supply and to the country as a whole.

They realize he is the arch enemy to decent wages, decent living and decent profits. He converts all assets into liabilities, surpluses into deficits and satisfactory tax returns into higher taxes. He is the outstanding evil in everything constructive, and his operations only lead to destruction for himself as well as to others.

We are all interested in lower taxes. The greatest thing to bring about lower taxes is for all industry to make a fair profit, thereby creating for the Government a tremendous increase in tax returns, and a marked increase in buying power will also be created, thereby further increasing our prosperity and, with it, greater returns to our Government in the form of taxes.

Better Distribution Means Sharp Reduction in Costs

The brains of industrial America in the past have been devoted to the upbuilding of industry from a manufacturing standpoint. Untold millions have been expended annually on improved machinery and manufacturing methods to create low-cost production, and we have succeeded beyond our fondest expectations.

During all these years we have neglected a proportionate expenditure of brain power and money in proper methods of selling and distribution, as a result of which we have wasted millions in selling that we have saved in manufacturing, with the result as indicated in my opening remarks, that almost half of our business corporations are now operating at a loss.

Now the reaction has set in, and the same brains that created our manufacturing success are now confining a great deal of their attention to the subject of how to sell and distribute, so that the era of profitless prosperity will be eliminated, and we will go forward on a basis so that all men engaged in business activities—labor, employees of all kinds, executives and stockholders—will receive a satisfactory return for their endeavor.

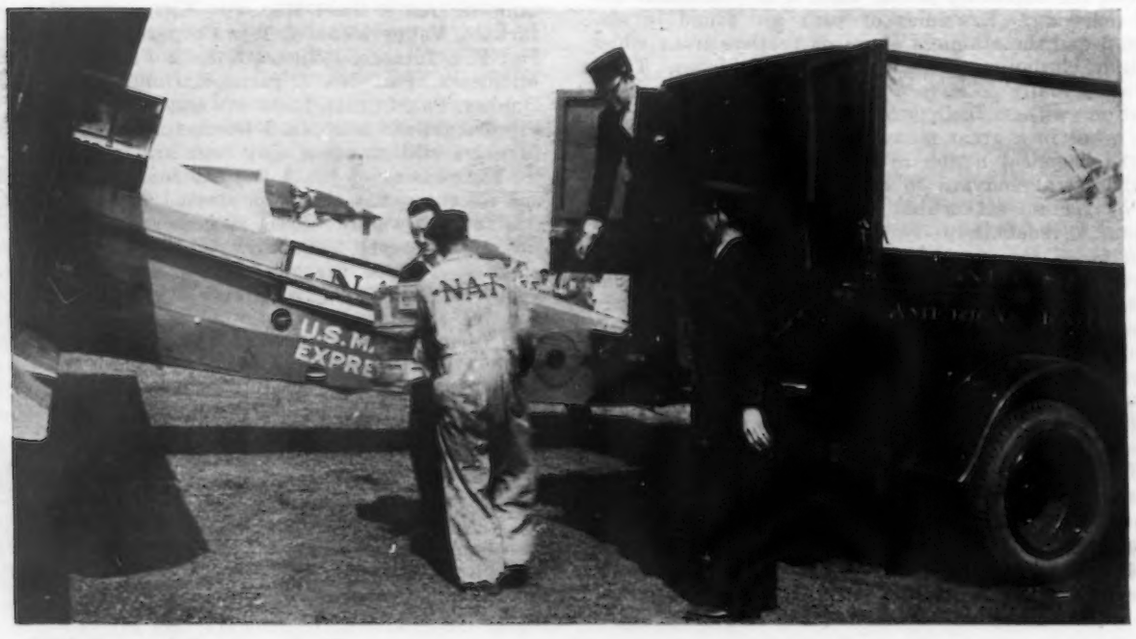
It seems strange that in all these years our business executives in their struggle for cost reduction have overlooked the greatest single factor in this very important line of any ever undertaken.

Take our industry again as an example, this recent move of ours, in creating the proper channels of distribution of our products, is the greatest we have ever made in cost reduction.

It will mean a marked reduction in our sales expense, and will also go completely through the organization, beginning where actual manufacturing stops—shipping expense, packing expense, clerk hire, accounting, stationery and office supplies—and such savings will eventually react to the benefit of the ultimate consumer.

Steel Shipped 236 Miles by Airplane

STEEL has been shipped by airplane, possibly for the first time. Joseph T. Ryerson & Son, Inc., report that they have just forwarded a rush shipment from Chicago to Iowa City, Iowa. The Iowa City Iron Works telegraphed to the Ryerson warehouse in Chicago for a small quantity of rivets. It was late afternoon and the rivets were needed at once. The order was made up immediately and rushed to the American Railway Express, arriving at the air station in time to catch the 7.50 p. m. airplane express. One hour and 50 min. later the airplane landed in Iowa City, 236 miles away. The rivets were dropped and were in use that night.



Year's Exports Highest Since 1921

Slight Gain Over 1926, Due to Heavy Pig Iron and Scrap Shipments—Finished Steel Exports Lower—Imports Fall Off

WASHINGTON, Jan. 28.—While exports of iron and steel products in 1927 increased only 13,756 gross tons over those for 1926, going to 2,180,969 tons from 2,167,213 tons, imports in 1927 dropped 359,582 tons, or a little more than 34 per cent, declining to 750,467 tons as against 1,110,049. Exports in December, 1927, totaled 168,428 tons, against 177,928 in November, and imports were 64,188 tons and 61,882 tons respectively.

Results of our international trade in iron and steel in 1927 are looked upon as showing that the European Steel Entente and the numerous cartels, instead of making headway in gaining a foothold in the American market, or preventing domestic steel manufacturers from maintaining their foreign markets, lost in both directions in the aggregate.

While the sharpest decline in the import movement was in pig iron, with a total of 133,068 tons in 1927 compared with 445,773 tons in 1926, there were important decreases also in the importation of a number of important finished lines, including steel bars (decline of 12,000 tons), iron bars (1400 tons), rails (46,600 tons), and wire products other than barbed (3250 tons). The decline in imports of rails in 1927 was due largely to a single factor, the 1926 movement, amounting to 62,776 tons as against 16,145 tons in 1927, being made up to an important degree of imports from Germany for the Boston & Maine Railroad.

There were, however, some substantial increases in imports of semi-finished and finished lines in 1927, when compared with 1926. These included wire rods (8000 tons increase), hoops and bands (5300 tons), sheets (5100 tons), structural shapes (40,000 tons) and seamless tubes (all wrought pipe, increased 19,000 tons). The greatest gain was in structural shapes, which increased to 161,848 tons in 1927 as against 121,099 tons in 1926, with the bulk of the tonnage coming from Belgium.

The greatest export movement in 1927 was in tin plate, with 254,131 tons as compared with 250,782 tons the preceding year, and wrought pipe (258,476 tons, against 287,822 tons in 1926). Scrap made the most important gain, going to 238,303 tons from 104,738 tons. Slight increases were made in plates, plain wire and barbed wire and woven wire fencing. Substantial losses were shown in steel bars, galvanized sheets, black sheets, hoops and bands, plain and fabricated structural material, steel rails and welded pipe.

Of the steel exports in December, 61,256 tons went

Exports of Iron and Steel from the United States

(In Gross Tons)

	December		12 Months Ended December	
	1927	1926	1927	1926
Pig iron	3,079	2,651	50,992	25,208
Ferromanganese	75	50	1,641	793
Scrap	22,668	7,711	238,303	104,738
Pig iron, ferroalloys and scrap	*25,822*	*10,412*	*290,936*	*130,739*
Ingots, blooms, billets, sheet bar, skelp	2,610	5,918	98,613	100,956
Wire rods	1,448	2,795	16,128	19,646
Semi-finished steel	*4,058*	*8,713*	*114,741*	*120,602*
Steel bars	7,983	10,952	111,121	137,770
Alloy steel bars	700	341	6,149	4,944
Iron bars	94	374	3,872	5,171
Plates, iron and steel	15,444	8,806	139,632	138,258
Sheets, galvanized	9,574	17,163	152,175	178,636
Sheets, black steel	8,181	19,545	152,497	175,740
Sheets, black iron	2,506	2,790	17,163	19,252
Hoops, bands, strip steel	2,751	3,135	43,160	46,912
Tin plate; terne plate	15,856	31,735	254,131	250,782
Structural shapes, plain material	14,310	10,617	148,069	157,121
Structural material, fabricated	4,811	6,843	68,637	77,853
Steel rails	15,717	19,445	175,539	187,557
Rail fastenings, switches, frogs, etc.	4,383	2,853	35,806	41,771
Boiler tubes, welded pipe and fittings	18,982	32,106	258,476	287,822
Plain wire	2,891	1,878	35,482	31,311
Barbed wire and woven wire fencing	4,128	1,591	52,393	50,718
Wire cloth and screening	167	176	2,268	1,989
Wire rope	398	333	4,569	4,779
Wire nails	1,369	628	9,993	11,743
Other nails and tacks	874	530	8,453	7,924
Horseshoes	54	34	563	661
Bolts, nuts, rivets and washers, except track	1,196	925	12,218	13,220
Rolled and finished steel	*132,369*	*172,800*	*1,692,566*	*1,831,936*
Cast iron pipe and fittings	1,612	3,201	27,964	34,111
Car wheels and axles	827	675	16,661	16,679
Iron castings	1,525	406	11,727	8,838
Steel castings	572	555	7,004	7,566
Forgings	351	144	4,868	2,644
Castings and forgings	*4,887*	*4,981*	*68,224*	*69,838*
All other	1,292	1,283	14,702	14,098
Total	168,428	198,189	2,180,969	2,167,213

Imports of Iron and Steel into the United States

(In Gross Tons)

	December		12 Months Ended December	
	1927	1926	1927	1926
Pig iron	14,299	14,783	133,068	445,773
Ferromanganese*	8,334	7,411	34,023	43,932
Ferrosilicon‡	788	1,341	7,753	13,125
Ferrochrome§	....	....	435	525
Scrap	3,462	6,407	60,203	86,725
Pig iron, ferroalloys and scrap	*26,883*	*29,942*	*235,482*	*590,080*
Steel ingots, blooms, billets and slabs	1,917	1,675	13,702	30,825
Iron blooms, slabs, etc.	....	25	91	348
Wire rods	1,075	868	17,990	10,074
Semi-finished steel	*2,992*	*2,568*	*31,783*	*41,247*
Rails and splice bars	641	982	16,145	62,776
Structural shapes	14,529	10,454	161,848	121,099
Boiler and other plates	544	795	4,035	4,946
Sheets and saw plates	1,338	1,615	15,804	10,671
Steel bars	8,117	6,324	91,497	103,473
Bar iron	822	590	4,220	5,623
Hoops, bands and cotton ties	2,077	2,885	33,773	28,407
Tubular products (wrought)	1,725	5,318	50,088	31,073
Nails, tacks, staples	224	456	1,064	5,354
Tin plate	10	70	5,665	2,160
Bolts, nuts, rivets and washers	26	4	356	360
Round iron and steel wire	296	506	3,962	4,330
Barbed wire	261	206	4,027	3,056
Flat wire; strip steel	144	187	2,543	3,678
Steel telegraph and telephone wire	3	3	35	1,128
Wire rope and strand	150	61	2,178	2,492
Other wire	17	114	1,145	1,485
Rolled and finished steel	*30,924*	*30,570*	*398,385*	*392,111*
Cast iron pipe	3,112	12,094	81,769	83,873
Castings and forgings	277	385	3,048	2,738
Total	64,188	75,559	750,467	1,110,049
Manganese ore*	31,771	26,971	308,594	354,223
Iron ore	131,837	205,035	2,620,717	2,555,441
Magnesite (dead burned)	4,404	911	44,976	67,596

*Manganese content only.
‡Silicon content only.
§Chromium content only.

United States Imports of Iron and Steel Products in December, 1927

(In Gross Tons)

Austria	1,815
Belgium	16,118
Czechoslovakia	22
Denmark	21
France	6,535
Germany	8,404
Italy	4
Netherlands	3,549
Norway	3,308
Poland and Danzig	538
Sweden	2,641
Switzerland	2
United Kingdom	5,276
Canada	7,855
Cuba	53
British India	8,044
Japan	3
Total	64,188

to Canada, while that country, easily the largest consumer of American steel products, took 831,177 tons in 1927, against 833,856 tons in 1926. Japan took 27,054 tons in December and in 1927 took 278,207 tons against 260,361 tons in 1926. There were gains in exports to some South American countries in 1927 over the preceding year, Argentina taking 82,380 tons against 60,105 tons, and Brazil taking 70,635 tons against 62,542 tons. There were losses in exports to Chile and Colombia. Chile took 44,641 tons as compared with 61,642 tons, while Colombia took 59,080 tons as against 71,142 tons.

Japan led by a small margin as the destination of 1927 exports of steel rails, taking 29,474 tons as compared with 29,214 tons for Canada. Canada took 112,147 tons of the 139,632 tons of plates exported last year; 71,559 tons of the 152,175 tons of galvanized sheets exported; 121,514 tons of the 148,069 tons of plain structural material exported; 41,918 tons of the tin plate; 65,399 tons of the 111,121 tons of steel bars and 62,250 tons of the 152,497 tons of black sheets exported, Japan taking 61,849 tons. Japan led as the destination of tin plate exports, taking 54,685 tons.

Of the 14,529 tons of structural material imported in December, Belgium supplied 8664 tons; Germany, 2444 tons; France, 1876 tons; Austria, 1195 tons. Of the 8117 tons of steel bars imported that month, Belgium furnished 3824 tons; Germany, 1954 tons; Sweden, 865 tons. France supplied 2456 tons of the 3112 tons of cast iron pipe imported, while 649 tons came from Belgium. Of the 31,771 tons of manganese concentrates imported, Soviet Russia supplied 15,161 tons; Brazil, 10,160 tons; British West Africa, 2834 tons, and British India, 2691 tons. Of the 8334 tons of ferromanganese imported during the month, Canada supplied 4252 tons; Norway, 2641 tons; United Kingdom, 1441 tons. British India was the source of 8044 tons of pig iron imports; Netherlands, 3451 tons; United Kingdom, 2741 tons.

Of the total imports in December, 16,118 tons came from Belgium, 8404 tons from Germany, 8044 tons from India, 7855 tons from Canada, 6535 tons from France and 5276 tons from the United Kingdom. These six countries accounted for 81 per cent of the total incoming tonnage.

Operation of Industrial Locomotives

Coal and Water Consumption of Saddle-Back Unit Determined in Service Tests—Operated Without Cylinder Cut-Off

BY FRED M. REITER*

TO check the operation of a standard four-wheel, saddle-back, industrial locomotive, made by the H. K. Porter Co., some data were taken and calculations made. The object was to determine coal and water consumption, and note how often the locomotives should refuel and take water. The data were taken as a standard to check the actual operation of the locomotives. Time studies were made to determine the duration of runs, piston speed (obtained from r.p.m. of driving wheels), steam conditions, etc.

In determining water consumption, the cylinder conditions were as follows: Bore, 17¼ in.; stroke, 24 in.; piston rod, 3¼ in. This resulted in a piston area of 233.7 sq. in. at the head end and of 225.4 sq. in. at the crank end, the average being 229.6 sq. in. The total volume of the two cylinders, each revolution of a driving wheel, figures out at 12.8 cu. ft.

Steam at average boiler pressure of 150 lb. gage represented 360 deg. Fahr. The average cylinder pressure was throttled to 60 lb. gage, with 5 per cent moisture. The locomotive was operated with the reverse lever open wide, regulation of speed being made by the operating throttle. Thus no cut-off occurs in the cylinder, although the pressure is considerably reduced.

Consumption of Steam

Density of steam at 60 lb. gage is 0.1721 lb. per cu. ft. The moisture in it weighs 0.0130 lb., making the total weight 0.1851 lb. The average operating speed of the engine was 23 r.p.m., determined by count at the driving wheel. The weight of steam consumed each hour at 23 r.p.m. was 3268 lb. This represents a consumption of 394 gal. of water an hour, to which must be added 12 gal. for the air-brake engine.

Losses included 1 per cent for popping, 2 per cent for blow-off and 7 per cent of steam to the flues for producing draft and for leaks, etc. This makes a total of 10 per cent. Injector steam is not figured, as this is returned to the boiler with the water. Thus the apparent water consumption of 406 gal. an hour figures up to 450 gal. an hour total.

The tank capacity (saddle back) is 1650 gal. Of this amount 210 gal. in the legs of the tank cannot be taken out by the injectors. This leaves 1440 gal. net delivered by the tank. With low water in the boiler, when the locomotive is filled, an additional 610 gal. would be required, making a total of 2050 gal. put in each time the tank is filled.

Dividing this amount by 450 gal. an hour gives 4.54 hours duration of the water supply under steady continuous operation. As the locomotive is idle, between runs, about 40 per cent of all time, including the periods when steam is off and the locomotive is coasting, etc., the overall duration of water per fill is about 7.6 hr.

Heat Units Taken from Coal

Heat input into water at 200 deg. Fahr. to produce steam at 150 lb. gage pressure is 1017 B.t.u. per lb. The total heat per hour to make steam thus figures out at 3,847,311 B.t.u. an hour. About 2 per cent of the water is used for blow-off, having been heated from 200 to 360 deg. This adds 12,160 B.t.u., making the total heat absorption of the boiler 3,859,471 B.t.u. an hour. With a boiler efficiency of 50 per cent, the heat supplied by the coal must be 7,720,000 B.t.u. an hour.

Consumption of coal of 13,500 B.t.u. per lb. calorific value would thus be 572 lb. an hour. Figuring on 40 per cent idle periods, this reduces to 343 lb. The bunker capacity with the fire low before loading and maximum coal taken on was found to be 1700 lb. Thus the duration of one fill or coal supply works out at just under five hours.

Actual operation of the locomotives, when operated with reasonable care, checked these figures closely.

*Dayton Power & Light Co., Dayton, Ohio.

Where Steel Exports Went in Nineteen Twenty-Seven

Canada Took 522,034 Tons of Nine Leading Items—Japan Retains Second Position with 158,664 Tons, Followed by Argentina with 58,618 Tons and Cuba with 51,299 Tons

Exports from United States, by Countries of Destination

(In Gross Tons)

	Steel Plates				Galvanized Sheets				Black Steel Sheets			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*15,444*	*8,806*	*139,632*	*138,258*	*9,574*	*17,163*	*152,175*	*178,636*	*8,181*	*19,545*	*152,497*	*175,740*
Canada	12,028	5,786	112,147	111,295	635	1,705	71,559	42,487	2,825	5,023	62,250	65,210
Japan	943	39	2,148	529	171	328	3,625	5,378	3,296	10,214	61,849	88,796
Cuba	82	50	846	1,289	425	2,153	10,945	12,005	114	130	1,207	674
Philippine Islands	370	....	2,082	....	1,755	2,062	19,004	23,362	41	....	2,739	....
Mexico	16	102	815	1,522	531	545	8,254	9,083	68	....	1,652	....
Argentina	....	....	....	....	615	1,289	9,207	10,357	57	516	1,882	1,590
Chile	....	....	....	....	....	1,121	....	6,940	843	....	5,910	....
Colombia	....	....	....	....	767	935	8,940	7,992	34	....	595	....

	Steel Rails				Barbed Wire				Plain and Galvanized Wire			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*15,717*	*19,445*	*175,539*	*187,557*	*4,128*	*1,591*	*52,393*	*50,718*	*2,871*	*1,878*	*35,482*	*31,311*
Canada	1,714	627	29,214	26,343	6	17	3,580	5,297	1,038	781	14,453	11,878
Japan	914	6,143	29,474	34,378	....	....	....	....	251	111	702	1,335
Cuba	402	3,524	18,619	19,810	284	117	4,107	2,372	43	122	1,171	1,348
Philippine Islands	....	152	5,284	5,181	261	13	2,957	4,761	11	....	591	....
Mexico	1,031	332	7,744	9,670	580	282	4,407	2,347	131	269	3,701	5,564
Argentina	....	....	....	....	912	....	6,810	2,065	522	....	6,971	2,857
Chile	301	552	4,241	9,270	32	....	944	....	....	....	....	....
Colombia	....	5	....	4,964	....	355	....	6,301	....	....	....	....
Brazil	776	6,020	22,642	23,467	392	32	9,109	6,357	154	....	415	....

	Tin Plate				Plain Heavy Structural Material				Steel Bars			
	December		12 Months Ended December		December		12 Months Ended December		December		12 Months Ended December	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Total	*15,856*	*31,735*	*254,131*	*250,782*	*14,310*	*10,617*	*148,069*	*157,121*	*7,983*	*10,952*	*111,121*	*137,770*
Canada	1,827	3,639	41,918	49,902	11,730	8,281	121,514	119,590	4,453	5,131	65,399	82,741
Japan	5,743	7,446	54,685	49,062	531	66	4,584	5,380	203	67	1,597	2,173
Cuba	248	903	3,761	3,124	293	503	7,473	7,201	234	146	3,170	3,452
Mexico	894	771	12,177	9,299	....	....	....	....	....	195	....	3,412
Argentina	1,711	2,517	33,415	16,573	....	....	....	....	7	118	333	2,830
Chile	502	1,230	5,805	7,031	198	714	2,810	6,593	123	167	191	2,879
Brazil	....	1,277	....	5,868	....	....	....	....	....	....	....	....
China	....	4,764	8,949	24,178	....	....	....	....	....	....	....	....
British India	....	253	....	14,591	....	....	....	....	....	....	....	....
United Kingdom	....	....	....	....	....	....	....	....	1,380	3,423	17,952	27,396
Italy	....	183	....	10,126	....	....	....	....	....	....	....	....

Destination of All Iron and Steel Exports from the United States

(In Gross Ton)

Country of Destination	December, 1927	Calendar Year 1927	Calendar Year 1926
North and Central America and West Indies	*81,033*	*1,088,577*	*1,107,964*
Canada and Newfoundland	61,787	832,984	834,858
Cuba	5,006	92,486	94,708
Mexico	6,295	81,656	100,837
Guatemala	333	6,124	10,125
Salvador	3,452	7,140	16,277
Panama	1,186	18,881	9,015
Other Central America	1,401	13,222	14,292
British West Indies	629	12,384	10,580
Other West Indies	944	23,700	17,272
South America	*27,713*	*348,899*	*373,102*
Argentina	6,915	82,380	60,105
Brazil	3,492	70,635	62,542
Chile	4,917	44,641	61,642
Colombia	5,192	59,080	71,142
Peru	1,776	32,207	37,819
Venezuela	3,486	44,918	68,116
Other South America	1,935	15,038	11,736
Europe	*9,785*	*197,326*	*144,154*
France	173	4,586	10,393
Italy	1,763	41,832	23,486
Rumania	749	2,457	2,591
Russia	6	8,102	3,073
Turkey in Europe	77	3,711	3,032
United Kingdom	4,316	66,915	68,809
Other Europe	2,701	69,723	32,770
Far East	*47,127*	*526,268*	*523,333*
Australia	1,670	26,672	33,353
British Malaya	723	8,444	15,520
China	4,748	53,843	46,054
Dutch East Indies	1,912	35,259	41,028
India	1,792	28,215	37,097
Japan and Chosen	27,054	278,207	260,361
Kwangtung	344	18,969	20,247
Philippine Islands	6,702	63,334	57,554
Other Asia and Far East	2,182	13,325	12,619
Africa	*2,770*	*19,899*	*18,160*
British South Africa	2,442	10,403	9,393
Egypt	86	4,554	5,761
Portuguese East Africa	61	3,827	2,299
Other Africa	181	1,115	707
Total	168,428	2,180,969	2,167,213

Machinery Exports High in 1927

Second Largest Dollar Value in History—Exceed 1926 by Nearly $36,000,000—Imports Show Slight Gain

WASHINGTON, Jan. 28.—Making a gain of $35,608,101, exports of machinery in 1927 aggregated $435,476,591 as against $399,868,490 in 1926, while imports of machinery and vehicles for the two years amounted to $27,517,361 and $26,211,967 respectively. Imports of the machinery and vehicles listed in THE IRON AGE table totaled $18,603,229 in 1927 and $17,137,056 in 1926. Imports of industrial, office and printing machinery in 1927 were valued at $16,452,625 last year and $16,450,043 the preceding year.

Exports of industrial machinery in 1927 amounted to $201,473,555, against $179,556,215 in 1926, while exports of "other industrial machinery" were valued at $69,048,380 and $55,010,374, respectively. Exports of power-driven metal-working machinery last year were valued at $20,345,478, while in 1926 the value was $14,316,274. Other metal-working machinery to the value of $5,051,314 was exported in 1927 as compared with $4,551,248 in 1926.

Machinery exports listed in THE IRON AGE table reached a value of $38,169,898 in December, against $36,187,195 the month before and $32,111,380 in December, 1926. Industrial machinery to the value of $17,206,531 was exported in December, against $17,101,313 in November and $15,486,344 in December, 1926. Exports of all power-driven metal-working machinery in December were valued at $2,352,753, against $1,202,648 in December of the preceding year, while the respective values of exports of other metal-working machinery were $568,104 and $376,144. Exports of "other industrial machinery" in December, 1927, and the corresponding month of the preceding year were valued at $5,890,035 and $5,260,901, respectively. Respective imports of industrial, office and printing machinery were valued at $1,208,764 and $1,438,565.

Bilton Machine Tool Co. to Be Sold at Auction April 3

Assets of the Bilton Machine Tool Co., Bridgeport, Conn., have been ordered to be sold at public auction on April 3 by Judge Edwin S. Thomas of the United States District Court. The order was issued upon motion of counsel for the receiver of the company. In making the motion, counsel for the receiver said that an offer of $500,000 had been received for the business. The company's property consists of real estate, buildings, plant property, equipment and machinery at Bridgeport.

Machinery Exports from the United States

(By Value, in Thousands of Dollars)

	December		12 Months Ended December	
	1927	1926	1927	1926
Locomotives	$639	$276	$5,327	$5,113
Other steam engines	47	43	1,361	1,306
Boilers	117	175	1,744	1,805
Accessories and parts	78	29	668	646
Automobile engines	286	327	10,885	12,522
Other internal combustion engines	463	645	7,105	9,130
Accessories and parts	181	316	3,218	4,273
Electric locomotives	163	129	1,321	2,968
Other electric machinery and apparatus	665	666	7,462	7,423
Excavating machinery	844	392	5,392	4,505
Concrete mixers	88	43	1,131	734
Road making machinery	167	54	2,218	1,688
Elevators and elevator machinery	331	410	4,873	5,195
Mining and quarrying machinery	975	1,103	13,286	14,857
Oil well machinery	870	1,375	16,843	15,303
Pumps	438	607	6,314	6,169
Bending and power presses	159	39	1,428	1,299
Forging machinery	131	68	1,109	1,059
Machine tools*	1,324	696	12,538	7,104
Rolling machines	58	47	542	402
Other metal-working machinery and parts	568	376	5,051	4,551
Textile machinery	1,092	1,047	11,466	10,400
Sewing machines	784	737	8,964	8,683
Shoe machinery	156	126	1,718	1,353
Flour-mill and gristmill machinery	106	71	626	863
Sugar-mill machinery	370	331	5,824	4,043
Paper and pulp mill machinery	332	477	3,823	3,846
Sawmill machinery	61	66	800	966
Other woodworking machinery	166	78	1,485	1,200
Refrigerating and ice-making machinery	586	470	7,454	5,059
Air compressors	408	315	5,873	4,665
Typewriters	2,317	1,683	20,856	18,220
Power laundry machinery	91	34	1,456	1,210
Typesetting machines	412	393	4,504	3,741
Printing presses	642	520	6,251	6,232
Agricultural machinery and implements	6,246	4,966	90,098	85,667
All other machinery and parts	15,807	12,983	154,463	135,666
Total	$38,170	$32,111	$435,477	$399,868

*Principal details are shown in another table.

Imports of Machinery into the United States

(By Value)

	December		12 Months Ended December	
	1927	1926	1927	1926
Metal-working machine tools	$22,800	$101,073	$413,821	$521,554
Agricultural machinery and implements	362,542	336,122	5,406,599	5,011,804
Electrical machinery and apparatus	123,639	77,263	1,772,435	844,551
Other power-generating machinery	6,352	735	279,118	76,202
Other machinery	621,323	655,720	8,106,724	8,452,955
Vehicles, except agricultural	277,760	202,321	2,624,532	2,229,990
Total	$1,414,416	$1,373,234	$18,603,229	$17,137,056

Exports of Power-Driven Metal-Working Machinery

	December, 1927		November, 1927	
	No.	Value	No.	Value
Engine lathes	79	$187,362	136	$264,480
Turret lathes	31	89,766	39	152,569
Other lathes	39	56,443	58	110,253
Vertical boring mills and chucking machines	26	73,582	15	36,671
Thread-cutting and automatic screw machines	47	42,483	109	134,763
Knee and column type milling machines	32	76,947	22	52,409
Other milling machines	75	223,241	74	196,801
Gear-cutting machines	38	105,639	36	85,490
Vertical drilling machines	34	24,551	79	28,797
Radial drilling machines	10	27,129	6	22,539
Sensitive drilling machines	57	9,843	26	11,971
Other drilling machines	36	25,704	47	55,113
Shapers and slotters	41	47,620	28	48,612
Planers	3	10,188	..	.....
External cylindrical grinding machines	67	148,073	80	184,206
Internal grinding machines	31	51,379	148	117,304
Metal-working tool-sharpening machines	34	25,885	49	33,344
Total	680	$1,225,835	952	$1,535,322

Machinery Markets and News of the Works

JANUARY TRADE SPOTTY

Good Business Reported by Some While Others Were Disappointed

Railroad Buying in Chicago Appears More Promising—Santa Fe to Issue List of Its Requirements

SOME machine tool manufacturers report that sales in January were considerably ahead of those in December, but the improvement was not shared by all companies, and in a number of instances December volume was not equaled in January. In general the past month was not up to expectations.

Railroad buying of machine tools at Chicago promises to get under way soon. The Santa Fe is about to distribute lists of its 1928 requirements, which probably will be large. Railroad buying so far this year has not been important. In the East the only inquiry of size is that issued a few weeks ago by the Delaware, Lackawanna & Western for about 30 machines. Orders have not yet been placed.

Inquiry from the farm machinery industry is steady and sales to this class of manufacturers, which have been of help in building up volume in Chicago, are expected to continue for several months. Purchasing by automobile companies has not been large, but it is conspicuously better than in the late months of last year. A motor company in the Detroit district has ordered 17 17-in. lathes, raising to a total of 24 the lathes bought by this company in two weeks. Other orders for small lots of tools have come from the Detroit district.

New York

NEW YORK, Jan. 31.

BUSINESS continues good with a fair volume of new inquiry and purchasing of single tools. The Mergenthaler Linotype Co., Brooklyn, is still buying equipment. The General Electric Co., Schenectady, N. Y., has been purchasing against a short list of tools and is still to close on a lathe and a 12-ft. planer. The International Motor Co., Plainfield, N. J., is expected to be in the market soon.

Except for the Delaware, Lackawanna & Western Railroad list of about 30 machines, the demand from railroads is light. The New York Central has issued several inquiries for single tools, but is not expected to purchase for several weeks. The Central Railroad of New Jersey has closed on a 30-in. x 16-ft. lathe with the Niles Tool Works.

Recent purchases by industrial users of machine tools have included a 13-in. x 30-in. lathe, two 7-in. x 32-in. bench lathes and a Racine Shear Cut saw by a Chicago manufacturer; four 16 x 36-in., two 16 x 60-in. and one 20 x 48-in. lathes and a No. 2 jig boring machine by a Michigan automobile manufacturer; a 20-in. x 48-in. engine lathe and a No. 2 jig boring machine by a New York State manufacturer; a No. 2 jig boring machine by a company in Syracuse, N. Y.; rebuilt Pratt & Whitney 14-in. vertical surface grinder by a tool maker in Pennsylvania; used 7 x 32-in. Pratt & Whitney bench lathe by a company in New York City; No. 3 Pratt & Whitney die sinking machine by a Detroit manufacturer; No. 2 jig boring machine by a Vermont company; cold saw by a Massachusetts plant; No. 131 Ransom grinder by a New Jersey machinery dealer; 22-in. x 14-ft. Morris lathe by a Pittsburgh manufacturer and four-spindle, drum type milling machine by a Detroit motor company.

Anaconda Copper Mining Co., 25 Broadway, New York, has approved plans for a new electrolytic zinc plant at its properties at Anaconda, Mont., to cost in excess of $500,000.

Seal Lock Burial Vault Co., Forest Hills, L. I., has plans for a one-story plant, to cost approximately $45,000 with equipment. W. J. Boegel, 185 Madison Avenue, New York, is architect.

Harry Harvie, 15 Hillside Avenue, Rockville Centre, N. Y., architect, has completed plans for a one and two-story automobile service, repair and garage building at Rockville Centre, to cost about $200,000 with equipment.

New York Telephone Co., 140 West Street, New York, is arranging an expansion and improvement program to cost $6,444,465, including underground cable plant in Brooklyn; outside plant facilities at Nyack, N. Y., and vicinity; central stations, switchboard equipment, lines, etc., at various points on Long Island, and additional testing facilities in Manhattan.

International Power & Paper Co., operated by International Paper Co., 100 East Forty-second Street, New York, has purchased Newfoundland Power & Paper Co., St. George district, Newfoundland, including a hydroelectric generating plant with capacity of 98,000 hp., paper mill with output of 400 tons per day, and about 2800 square miles of timber and pulp lands on the north coast of Newfoundland. New owner contemplates expansion and improvements in paper mill properties.

Columbia Corrugated Co., 270 Eleventh Avenue, New York, manufacturer of corrugated boxes and containers, has purchased the former air reserve depot of Government at Long Island City, comprising six and a half acres with 12 buildings, on a bid of $963,750, and contemplates establishment of a main plant at that location. It is understood that new structures will be erected.

Avery Garage Corporation, 154 Amity Street, Flushing, L. I., has plans for a one-story service, repair and garage building, 100 x 225 ft., to cost approximately $100,000 with equipment. Daniel Campbell, Jr., address noted, is architect.

New York Dock Co., 44 Whitehall Street, New York, will soon take bids on general contract for a ten-story factory at Joralemon and Furman Streets, Brooklyn, to cost in excess of $400,000. Russell G. Cory, 30 Church Street, is architect and engineer.

American Power & Light Co., an interest of Electric Bond & Share Co., 2 Rector Street, New York, is arranging for an increase in both common and preferred stocks, a portion of proceeds to be used for purchase of Washington Water Power Co., Spokane, Wash., operating hydroelectric power plants and transmission lines in eastern Washington and northern Idaho. New owner plans increased generating capacity and transmission system.

Union Railway Co., 2396 Third Avenue, New York, has authorized plans for a two and one-half story automobile service, repair and garage building at White Plains, N. Y., for bus service, to cost more than $125,000 with equipment. E. H. Faile & Co., 441 Lexington Avenue, are architects.

American Car & Foundry Motors Co., 30 Church Street, New York, is said to be planning establishment of new factory branch at Atlanta, Ga., to be used largely for manufacture of double-decked buses operated in that city by Georgia Power Co.

E. R. Squibb & Sons, 80 Beekman Street, New York, manufacturers of chemicals, etc., have awarded a general contract to White Construction Co., 95 Madison Avenue,

The Crane Market

THERE has been but little new inquiry in the past week, either for electric overhead or locomotive cranes. Some sizable business, however, is still pending. The Public Service Production Co., Newark, N. J., is expected to close in a few days on two 120-ton and one 65-ton overhead cranes. E. L. Phillips & Co., 50 Church Street, New York, have revised inquiry for a 60-ton overhead crane and are now asking for prices on a 40-ton electric crane for the Long Island Lighting Co. There are a number of current inquiries for medium and large capacity locomotive cranes but prospective purchasers are slow to take action.

Among recent purchases are:

Dwight P. Robinson, Inc., New York, 40-ton, 4-motor overhead crane for Gulf States Steel Co., Alabama City, Ala., from Niles Crane Corporation.

Edison-Portland Cement Co., Phillipsburg, N. J., 10-ton crawl-tread locomotive crane from an unnamed builder.

Lockwood, Greene & Co., 1 Pershing Square, New York, 20-ton, 29-ft. 6-in. span, 1-motor overhead crane and 5-ton, 7-ft. 10-in hand power crane for Elizabeth City, Tenn., from Box Crane & Hoist Corporation.

Paramount Finishing Co., Brooklyn, N. Y., ½-ton electric hoist from Box Crane & Hoist Corporation.

Artistic Dyeing Co., Brooklyn, ½-ton electric hoist from Box Crane & Hoist Corporation.

Charles Mundt & Son, Jersey City, N. J., 5-ton electric Hoist from Box Crane & Hoist Corporation.

Spence Iron Foundry, Jersey City, N. J., 1-ton electric hoist from Box Crane & Hoist Corporation.

New England Public Service Co., Lewiston, Me., 35-ton overhead crane from the Whiting Corporation.

for a twelve-story factory and distributing plant, 98 x 164 ft., at 18-30 Columbia Heights, Brooklyn, to cost about $1,000,000 with equipment. Russell G. and Walter Cory, 30 Church Street, New York, are architects and engineers.

Passaic Iron Works, Inc., 119 Fourth Street, Passaic, N. J., has plans for a one-story addition, 40 x 74 ft., to cost close to $20,000 with equipment. Preiskel & Skvarla, Playhouse Building, are architects.

Armstrong Cork Co., Codwise Avenue, New Brunswick, N. J., is considering rebuilding portion of local plant destroyed by fire Jan. 21, with loss close to $50,000 with equipment. Headquarters are at Lancaster, Pa.

Ovens, power equipment, conveying and other machinery will be installed in the three-story addition of Forester Bakery, Inc., Bergenfield, N. J., to cost upward of $100,000. McCormick Co., 41 Park Row, New York, is architect and engineer.

Newark Brush & Scraper Co., 266 Fabyan Place, Newark, has leased a two-story factory forming part of plant of Jennings Silver Co., 390 Nye Avenue, and will remodel for a new plant. Present works will be removed to new location early in March and additional equipment provided. Company has abandoned plans for an addition to present factory.

Board of Education, New Milford, N. J., is considering installation of manual training equipment in new high school to cost $360,000, for which plans will be prepared by Ernest Sibley, Bluff Road, Palisade, N. J., architect.

Public Service Electric & Gas Co., Public Service Terminal, Newark, has acquired 176 acres at West Orange, N. J., and contemplates construction of power substation and switching station on portion of site, remainder of land to be used for high tension transmission lines.

Lerner Brothers, 365 Market Street, Newark, manufacturers of handles, etc., have leased a three-story factory at 39-41 South Sixth Street for expansion and will remove to that location.

Knickerbocker, Cram & Co., Inc., 7 East Forty-second Street, New York, has been organized to succeed Knickerbocker Machine Tool Co., and will handle complete line of machine tools, many of which were formerly sold through discontinued machine tool department of Manning, Maxwell & Moore, Inc. Company's personnel will consist of former employees of that organization.

Panatone Corporation, New York, has been organized to manufacture new type of radio loud speaker and is under engineering management of Industrial Engineering & Finance Corporation, 5052 Grand Central Terminal, New York. Latter company will be in market for wire, magnets, wood-working materials and art cabinets.

Kastwell Foundry Co., Newark, has succeeded to business of Transfer Metal Casting Co., and will continue operation as general jobbing foundry.

Buffalo

BUFFALO, Jan. 30.

PLANS are maturing for a two-story vocational school for Board of Education, Genesee Building, Buffalo, to be known as Burgard Vocational School, to cost $1,000,000 with equipment, and for which bids on general contract will be asked by Ernest Crimi, address noted, architect for the board.

International Oxygen Co., 796 Frelinghuysen Avenue, Newark, N. J., manufacturer of compressed industrial gases, welding apparatus, etc., has begun construction of a new plant at Buffalo, to cost more than $75,000 with equipment. A preferred stock issue has been sold to provide in part for expansion.

Bids have been asked by J. A. Zurn Mfg. Co., Fourteenth and German Streets, Erie, Pa., manufacturer of plumbing equipment and supplies, gas burners, etc., for an addition, to cost close to $250,000 with machinery. Wilbur Watson & Associates, 1614 Prospect Avenue, Cleveland, are architects and engineers.

Niagara, Lockport & Ontario Power Co., Lafayette Building, Buffalo, will construct a steel tower transmission line at Salamanca, N. Y., and vicinity.

Board of Education, Kenmore, N. Y., plans installation of manual training equipment in a three-story addition to high school to cost $700,000, for which bids have been asked on general contract. F. J. and W. A. Kidd, 522-24 Franklin Street, Buffalo, are architects.

Chautauqua Heating Co., Inc., Salamanca, N. Y., recently formed with capital of $25,000 by Harold A. Watkins, Salamanca, and associates, is said to be planning a local factory for manufacture of radiators and other heating equipment.

Wire Wheel Corporation of America, Inc., 1700 Elmwood Avenue, Buffalo, is reported considering expansion in production, now averaging about 40,000 sets of wire wheels per month. Arrangements are being made for stock distribution to provide additional financing.

Syracuse K-U Corporation, 250 Walton Street, Syracuse, N. Y., has been organized to succeed Walker Kitchen Utilities Co. and will continue manufacture of dishwashing machinery and equipment and kitchen utensils. It is at present in market for small amount of equipment and is a buyer of sheet metal from time to time.

E. R. Caldwell & Son Co., Syracuse, N. Y., brass founder and manufacturer of brass castings, will be reorganized with view to wide production. Company went into voluntary bankruptcy last fall and settlement of 25c. on the dollar was accepted by creditors. Harold Coyne, superintendent of Reddin Iron Works, receiver, has been discharged.

Philadelphia

PHILADELPHIA, Jan. 30.

GENERAL contract has been let by Camden Rail & Harbor Terminal Corporation, Camden, N. J., to Cramp & Co., Denckla Building, Philadelphia, for a nine-story cold storage and ice-manufacturing plant, 105 x 285 ft., to cost more than $2,000,000 with equipment. Company was organized recently by Frederick Cohen, Merchantville, N. J., and J. A. Raulerson, 127 South Sixty-third Street, and has disposed of bond issue of $2,250,000, to provide for erection. Mr. Raulerson is president. Moores & Dunford, Inc., 110 East Forty-second Street, New York, is architect and engineer.

John Galbraith, 619 Commerce Street, Philadelphia, manufacturer of wooden and metal-reinforced boxes and containers, has awarded general contract to Schaeffer & Co., 1600 Arch Street, for a one-story addition, 36 x 120 ft., to cost close to $40,000 with equipment.

Norton Co., 3208 Market Street, Philadelphia, manufacturer of grinding wheels and other abrasives, with main plant at Worcester, Mass., has plans for a new local factory branch and distributing plant for which bids will soon be asked on general contract. Ballinger Co., 105 South Twelfth Street, is architect and engineer.

United Gas Improvement Co., Broad and Arch Streets, Philadelphia, is concluding purchase of traction system of

Wilmington Light & Power Co., Wilmington, Del., from American Electric Power Co., New York, latter taking over utility properties at Sioux City, Iowa, heretofore held by first noted company. Extensions and improvements will be carried out in Wilmington district, including power line construction. Properties will continue under directon of Stevens & Wood, Inc., 120 Broadway, New York, engineer, which is now preparing plans for a steam-operated electric generating station near Pennsville, N. J., for Wilmington and other utilities, to cost in excess of $7,000,000.

G. A. Drieling Co., Philadelphia, has been formed with a capital of $25,000 to take over and expand company of same name, with sheet metal works at 1914 North Fifth Street. New company will also manufacture iron and steel products, as well as machine equipment and devices.

Board of Trustees, Lafayette College, Easton, Pa., has engaged C. Z. Klauder, 1429 Walnut Street, Philadelphia, architect, to prepare plans for a new engineering building, with mechanical and testing equipment, to cost $500,000 with machinery.

Keystone Aluminum Die Casting Co., Philadelphia, has been organized by William H. Brown, 6370 Church Road, and Frank Brown, to operate a local plant for production of die-castings and kindred specialties, with capital of $50,000.

C. Edward Smith Hardware Co., 314 East Washington Street, New Castle, Pa., has plans for a three-story and basement storage and distributing plant to cost $55,000. W. J. Eckles Co., Lawrence Savings & Trust Building, is architect.

Harrisburg Gas Co., Harrisburg, Pa., is arranging for an increase in funded debt from $2,500,000 to $10,000,000, of which bonds in amount of $2,500,000 will be sold in near future, a portion of fund to be used for extensions and improvements. Initial work will comprise a budget of $350,000, for additional purification and auxiliary gas plant machinery, pipe lines, etc. L. S. Williams is president.

B. F. Shaw Co., Second and Lombard Streets, Wimington, Del., manufacturer of pipe, steam fitters' supplies, etc., recently reorganized with W. Miller Shaw as president, has plans for expansion to cost close to $150,000 with equipment, including enlargement in pipe fabricating works.

Scranton Coal Co., Scranton, Pa., is considering rebuilding its equipment and mine supply storage and distributing plant at Dickson City, Pa., destroyed by fire Jan. 25, with loss estimated at $175,000.

L. B. Smith, White Hill, near Harrisburg, Pa., has secured six acres on Gettysburg Road, at terminus of car line, and will operate plant for rebuilding of motor trucks and motor buses.

Keystone Portland Cement Co., Bath, Pa., has work in progress on a new mill near city to cost more than $1,000,000, and will have initial unit ready for service in spring. John Buckland, Allentown, Pa., is president.

Chicago

CHICAGO, Jan. 30.

RAILROAD buying of machine tools promises to get under way as the Santa Fe starts distribution of inquiries for what appear to be its first large requirements for 1928. Quotations have been asked on a boiler flanging clamp, a 14-in. x 8-ft. tool-room lathe, 54-in. boring mill and a 36-in. x 16-ft. engine lathe. The Burlington is in the market for two double-end axle lathes.

Business in January was slightly better than in December, but well behind expectations of the trade. Fresh inquiry, however, lends hope to dealers that sales will be more brisk in February. Tool room equipment is active and punch presses have moved freely this week. Inquiry from farm implement manufacturers is steady and sales give promise of holding up for several months. Renewed activity is indicated by the Nash Motors Co., Kenosha, Wis.

Commonwealth Edison Co., 72 West Adams Street, Chicago, will build a substation, 140 x 160 ft. to cost $200,000. H. W. Green Construction Co., 9 South Clinton Street, is contractor.

Standard Oil Co., 910 South Michigan Avenue, Chicago, will build a two-story garage, 75 x 118-ft. to cost $35,000.

Plans are being considered by Blake Specialty Co., Sixteenth Avenue and Mill Street, Rock Island, Ill., manufacturer of pipe bends, etc., for one-story addition, to cost more than $25,000 with equipment.

Streator Cold Storage Door Co., LaRue Street, Streator, Ill., contemplates one and two-story addition, to cost close to $40,000 with equipment, and will prepare plans in about 30 days.

Fisher Governor Co., 201 First Avenue, Marshalltown, Iowa, manufacturer of engine governors, etc., has awarded general contract to Lippert Brothers, Boone, Iowa, for two-story addition, 70 x 125 ft., to cost about $50,000 with equipment. H. E. Reimer, 129 East Main Street, is architect.

Rockford Drop Forge Co., Rockford, Ill., has awarded general contract to Linden & Sons, 1110 Tenth Street, for one-story sawtooth roof addition to cost $30,000.

Glacier County Light & Power Co., Cut Bank, Mont., Frank Seal, head, is planning construction of a new generating plant on Two Medicine River, near Cut Bank, with transmission lines for service in Glacier Park, Browning and vicinity, to cost in excess of $175,000.

Iowa Packing Co., Eighteenth and Maury Streets, Des Moines, Iowa, is considering erection of a boiler plant, to cost approximately $100,000 with equipment.

Great Lakes Forge Co., 1212-58 West 119th Street, Chicago, has filed plans for a one-story addition, 90 x 100 ft.

Peoples Gas Light & Coke Co., 122 South Michigan Boulevard, Chicago, is arranging for an increase in capital from $60,000,000 to $75,000,000, a portion of proceeds to be used for expansion and improvements. Company is closing negotiations for purchase of combination water-gas plant and coke oven of Chicago By-Products Coke Co., and will develop enlarged output.

Rapid Roller Co., 800 Austin Avenue, Chicago, has engaged Schmid & Ryan, 77 West Washington Street, architect, to prepare plans for a new factory to cost in excess of $50,000 with equipment.

Lehigh Briquetting Co., Lehigh, N. D., has begun superstructure for its fuel briquette plant. Work will include coal crushing unit, briquetting unit, storage building and bins, machine shop and power house, to cost in excess of $500,000 with equipment. Ralph W. Richardson, Zenith Building, St. Paul, Minn., is engineer.

Rockford Auto Co., Oxford Street, Rockford, Ill., has begun erection of five-story and basement service, repair and garage building, 65 x 156 ft., to cost $135,000 with equipment. F. A. Carpenter, Brown Building, is architect.

Swift & Co., Union Stock Yards, Chicago, meat packers, are said to be completing plans for a new cold storage and refrigerating plant at Altamont, Ill., to cost approximately $80,000 with equipment.

Federal Public Service Co., operating Yankton Light & Heating Co., Yankton, S. D., and other light and power properties, has arranged for bond issue of $1,200,000, a portion of fund to be used for extensions and improvements.

New England

BOSTON, Jan. 31.

MORE machine tools were sold in January than in December or November, although the market cannot be said to be even moderately active. Sales the past week were confined almost exclusively to used equipment and included a milling machine, No. 18 Bliss press, bench lathe, bench miller, two 14-in. lathes, three drill presses and miscellaneous other equipment to manufacturers in this vicinity, and one No. 20 Garvin and one No. 2 Brown & Sharpe vertical milling machines to Oakland, Cal., interests. More inquiries have been received by local dealers for one, two or three tools, both new and used. General opinion among Boston houses is that there is more active inquiry before the trade than at any period during the past five or six months, and the outlook for sales the next two months is bright.

General business is better in New England than a month ago, which adds to the optimism of the machine tool trade. Orders received by Massachusetts manufacturers in December equaled those of November, according to the Associated Industries of Massachusetts index, which was 93.7 for December. The first full year index showed a falling off of less than 1 per cent in orders for 1927. The index is compiled from reports from 250 companies representing a capitalization of more than $450,000,000 and having at least 125,000 employees. New England machine tool builders in general are busier than a month ago, despite a falling off in export orders.

Pneumatic Drop Hammer Co., Boston, recently installed a battery of pneumatic lift gravity drop hammers at a Newburyport, Mass., plant and has received orders for other hammers from Ohio, Indiana, Greenfield, Mass., Providence and Connecticut manufacturers. To care for increasing demand, company has added to its mechanical equipment.

Smith Co., Milford, Mass., automobile safety devices, is negotiating for purchase of a plant in Hartford, Conn., and expects to move into it about March 1. Company plans to

manufacture other automobile accessories, all under newly incorporated name of Smithco Auto Safety Control Co., with capital of $100,000. Robert Smith is president.

Atlantic & Pacific Tea Co. has awarded general contract for a five-story, 105 x 273 ft., warehouse and bakery at Cranston, R. I., for which motors, handling equipment, etc., are required. H. L. Treeman, 1 Fitchburg Street, Somerville, Mass., is in charge.

General Electric Co., West Lynn, Mass., has purchased land on Boston Avenue., Bridgeport, Conn., on which it contemplates erection of a manufacturing plant.

Work has started on a power development for Springfield Railway Terminal Co., Springfield, Vt. Charles T. Main, Inc., 201 Devonshire Street, Boston, is engineer.

Charles H. Tenney Co., 200 Devonshire Street, Boston, engineer, is taking bids on a 35 x 50 ft. boiler plant addition to Brockton Gas Light Co., 54 Main Street, Brockton, Mass., to cost, with equipment, $130,000.

Watertown Builders' Supply Co., 418 Arsenal Street, Watertown, Mass., manufacturer of building materials, has plans under way for a three-story plant to cost close to $40,000 with equipment. H. F. Bryant, 334 Washington Street, Brookline, Mass., is architect.

E. H. Hotchkiss Co., Hoyt Street, Norwalk, Conn., manufacturer of snap fasteners and other metal specialties, is receiving bids for one-story addition, 50 x 132 ft., instead of two-story structure as originally intended, to cost upward of $40,000 with equipment. Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect and engineer.

Richards & Co., Inc., 269 Ludlow Street, Stamford, Conn., manufacturer of lacquers, etc., has begun erection of additions, including two-story extractor and beater units, 30 x 60 ft. and 35 x 65 ft., respectively; boiler house, 80 x 110 ft., and other structures, to cost $85,000, for which general contract recently was let to J. W. Ferguson Co., Paterson, N. J.

New England Public Service Co., Worcester, Mass., has purchased plant and property of Franklin Light & Power Co., Franklin, N. H. Plans are under way for expansion, including transmission line construction. Company is also securing control, it is said, of Tilton Electric Co., Tilton, N. H., and will expand in that territory. Purchasing company is operated by Middle West Utilities Co., Chicago.

Southern New England Ice Co., 48 Edwards Street, Hartford, Conn., will erect one-story plant with capacity of 75 tons per day, to cost close to $100,000 with machinery.

Universal Car Co., North Attleboro, Mass., will soon begin construction of a one-story and basement service, repair and garage building, 65 x 100 ft. Machine shop and parts division will be installed.

Thames Sheet Metal Works, 14-18 Hamilton Street, New London, Conn., has been organized to operate metal fabricating plant. Principal products will be metal ovens, tanks, ducts, breechings, smoke stacks, ventilators, skylights and cornices. Company has plant in operation but will be in market for more equipment and materials.

Pittsburgh

PITTSBURGH, Jan. 30.

JANUARY has been a good month for a few machine tool dealers, but rather lean in point of sales for the majority. There has been good inquiry, but many seem to have been for getting prices on which to formulate requests for appropriations. In the past week distribution of about 10 tools for the Herron Hill High School by the Pittsburgh Board of Education has added to the business of a few firms.

In heavy machinery, inquiry continues better than actual business. Crane builders and makers of rolling mill equipment are very busy in their estimating departments. A seamless pipe mill projected for the McKeesport works, National Tube Co., will probably be installed either at Lorain, Ohio, or Gary, Ind. The hot-rolled strip mill for Sharon Steel Hoop Co., which is understood to be a 13-stand unit, is yet to be placed. A Pittsburgh builder has contract for the new wide strip mill for Wheeling Steel Corporation.

Barton E. Brooke and H. R. Dyer, Dollar Bank Building, Youngstown, Ohio, architects, are preparing plans for a three-story automobile service, repair and garage building at Sharon, Pa., to cost $150,000, for which bids will soon be asked.

Harry G. Blanck, 2716 Veteran Street, Northside, and George D. Gianakos, Monterey and North Avenues, Pittsburgh, have formed Gianakos-Blanck Co., to operate a local plant for manufacture of kitchen and confectioners' equipment, and kindred metal goods.

United States Engineers Office, Pittsburgh, will soon ask bids for turbine engines, pumping equipment and piping for gate structure at Lock No. 6, Allegheny River. Plans have been approved for a power house at this location, and operating machinery also for cover plates.

Borough Council, Springdale, Pa., is considering purchase of water-softening plant for the municipal waterworks, to cost $40,000. J. F. Pierce is borough manager.

Pennsylvania Power Co., Sharon, Pa., has applied for permission to construct a steel tower transmission line across Mahoning River, near Mahoningtown, Ohio. Stevens & Wood, Inc., 120 Broadway, New York, is engineer.

Arrangements are being made by American Window Glass Co., Farmers' Bank Building, Pittsburgh, for resumption of operations at its plant at Bellevernon, Pa., closed for several years. Remodeling is under way and improvements and replacements will be made in equipment.

Joint School Boards of Ebensburg and Cambria Township, Ebensburg, Pa., are considering installation of manual training equipment in a high school to cost $170,000. H. M. Rogers, Johnstown Trust Building, Johnstown, Pa., is associate architect.

South Atlantic States

BALTIMORE, Jan. 30.

PLANS are being completed by George A. Whiting, president Standard Wholesale Phosphate Co., and Standard Acid Works, Inc., Continental Building, Baltimore, and associates for new plant in Curtis Bay Section for production of muriatic acid, to cost in excess of $300,000 with machinery. Same interests operate Consumers Acid Works, Inc., Curtis Bay, now building plant in that district for manufacture of sulphuric acid. Peter S. Gilchrist, president, Chemical Construction Co., Charlotte, N. C., is consulting engineer for new works.

Board of Awards, office of City Register, City Hall, Baltimore, is asking bids until Feb. 8 for materials for repair shops for Department of Education. Joshua R. Jolly, is acting secretary, Board of School Commissioners.

Warwood Ring Co., 200 North Eleventh Street, Baltimore, manufacturer of piston rings, etc., affiliated with Warwood Tool Co., same address, is reported considering erection of a new plant, to cost upward of $75,000 with equipment.

Georgia Steel & Iron Co., Tallapoosa, Ga., is said to be completing plans for works for production of horse-shoes, plate steel specialties and iron products, to cost close to $100,000 with equipment. Local buildings will be remodeled.

Duke Power Co., Charlotte, N. C., is completing plans for a new power transmission line from Canton, N. C., to Greenville, S. C., and vicinity, connecting with a recently completed hydroelectric generating station on Pigeon River, N. C., to cost more than $150,000.

Carolina Rubber Co., Salisbury, N. C., recently merged with Ajax Rubber Co., Racine, Wis., has plans for enlargements to cost upward of $90,000 with equipment. C. H. Waggener has recently been elected vice-president and general manager.

Bureau of Supplies and Accounts, Navy Department, Washington, is asking bids until Feb. 7 for one electric furnace for navy yard at Norfolk, Va., schedule 8413; also for trunnion roller bearings for Washington yard, schedule 8414; for 15,600 steel boiler tubes for Brooklyn Navy Yard, and 15,600 such tubes for Mare Island, schedule 8374, and for one bolt heading machine for Puget Sound yard, schedule 8388.

Crisp County Board of Commissioners, Cordele, Ga., has engaged J. E. Sirrine & Co., Greenville, S. C., and E. S. Killebrew, Albany, Ga., engineers, to prepare plans for a hydroelectric generating plant on Flint River, vicinity of Cordele, to cost $1,250,000 with equipment and transmission system. First noted will act as consulting engineer.

Hickory Wood Products Co., 507 East Third Street, Gastonia, N. C., is said to have leased additional property for new plant for production of tool handles and kindred turned wood products, to cost more than $20,000.

Board of Education, Durham, N. C., is considering installation of manual training equipment in an addition to junior high school to cost $200,000, for which superstructure will soon begin. Milburn, Heister & Co., First National Bank Building, are architects.

Savannah River Electric Co., Greenwood, S. C., has secured permission for a hydroelectric power development on Savannah River, near Clarks Hill, McCormick County, to cost upward of $10,000,000 with transmission system. O. G. Thurlow, Birmingham, is engineer.

P. C. Painter, city manager, Greensboro, N. C., is asking

bids until Feb. 7 for ash-handling equipment at municipal pumping plant.

Alfred Carper, Buchanan, Va., is head of a project to establish plant for production of metal automobile license tags and will soon secure prices and information on equipment.

Central of Georgia Railway Co., Savannah, Ga., has plans for a one and three-story storage and distributing plant, 52 x 125 ft., and 40 x 125 ft., to cost $60,000. G. A. Belden is architect.

Virginia Public Service Co., Charlottesville, Va., is planning construction of a transmission line in Natural Bridge National Forest district, Bedford and Amherst Counties, to cost upward of $75,000.

Milwaukee

MILWAUKEE, Jan. 30.

MACHINE-TOOL manufacturers are entering February with perhaps the best prospects for new business that have been before them in several months. January business, while not of large proportions, was better in comparison with any of the preceding six months. An encouraging development was in inquiries, action upon many of which is expected by February or March, with the automotive industries in particular. Foundries and machine shops in this territory report improving demand and employment is gaining.

Rhinelander Paper Co., Rhinelander, Wis., manufacturer of news print and book paper, contemplates installation of an additional machine unit, a new finishing room and a new steam generating plant at an estimated cost of $175,000.

Chamber of Commerce, Clintonville, Wis., is sponsoring organization of a $125,000 corporation to take over plant and good will of the Topp-Stewart Tractor Co., local, and engage in manufacture of highway construction and maintenance equipment, conveyors, etc., also continuing production of tractors. A going company, identity of which is as yet not revealed, has agreed to move its operation to Clintonville as part of new organization. D. J. Rohrer, Harry E. Brooks, C. F. Folkman, Max Stieg and Fred Ruth, Clintonville manufacturers and business men, constitute executive committee.

Common Council, Hartford, Wis., William Radtke, clerk, closes bids Feb. 7 for direct-connected fan and steam engine to deliver 18,000 cu. ft. per min. of air; direct-connected steam driven 25 kw., 120 volts d.c., exciter, and rewinding two electric generator units.

Federal Asbestos & Cork Insulating Co., 931 Thirtieth Street, Milwaukee, has acquired several buildings of former Johns-Manville works at Forty-second and State Streets, and will rebuild entire area as an additional production unit at an estimated cost of $75,000. General contract has been let to the Appleton Construction Co., I.O.O.F. Building, Appleton, Wis.

Mertes Machinery Co., 246 Oregon Street, Milwaukee, manufacturer and distributer of contractors' equipment and machinery, has purchased former plant of Crucible Steel Casting Co., 612 Clinton Street, which it is remodeling for general manufacturing and storage.

Star Pointer Pump Mfg. Co., Menasha, Wis., has changed its corporate title to Twin Cities Plumbing Supply Co., and will devote most of its attention to manufacturing and distributing supplies and materials for plumbing and heating trades.

Indiana

INDIANAPOLIS, Jan. 30.

A ONE-STORY addition, 60 x 100 ft., will be erected to plant of Truck Engineering Co., East Pontiac Street, Fort Wayne, Ind., to cost close to $80,000 with equipment. Work will begin in spring. Guy Mahurin, Standard Building, is architect.

Acme Tool & Machine Co., 924 Fort Wayne Avenue, Indianapolis, has acquired property, 40 x 217 ft., as site for new plant to cost about $35,000.

Oakes-Swenson Co., Indianapolis, recently formed, will operate a metal stamping works at East Nineteenth and Sheldon Streets. Carl G. Swenson and Perry Oakes are heads.

Board of Trustees, Purdue University, Lafayette, Ind., has awarded general contract to A. E. Kemmer, Third and Brown Streets, for a three and four-story service building for mechanical and other work, to cost $75,000. Walter Scholer, Painters' & Decorators' Building, is architect.

Board of Education, Brazil, Ind., plans installation of manual training equipment in a two-story addition to junior high school, to cost $125,000. McGuire & Shook, 941 North Meridian Street, Indianapolis, are architects. Charles P. Keller is superintendent of schools.

W. A. Folger, Fort Wayne, Ind., has plans for a one-story machine and repair shop to cost about $25,000. G. Mahwin, 425 Standard Street, is architect.

J. R. Gratham Motor Sales Co., 541 Washington Street, Gary, Ind., is completing plans for a three-story and basement service, repair and garage building, 75 x 110 ft., to cost $100,000 with equipment. Joseph H. Wildermuth, 583 Broadway, is architect.

Empire Box Co., 518 West Monroe Street, Chicago, manufacturer of paper boxes and containers, has superstructure in progress on a new plant at South Bend, Ind., to cost upward of $150,000 with machinery. W. M. Elwood, Christman Building, South Bend, is architect.

Vulcan Plow Co., Evansville, Ind., has purchased interests of Earl L. Yocum and Fred H. Hand in Hayes Pump & Planter Co., Galva, Ill., acquiring controlling interest in the Hayes company. Acquired plant will be continued in operation and production increased.

Cincinnati

CINCINNATI, Jan. 30.

WITH several notable exceptions, machine tool companies report that sales in January have been light and have not come up to volume attained in December. Inquiries before the trade, however, give promise of better business during February, and builders are of the opinion that buying will increase steadily in the next 60 days.

Purchases by automobile companies continue to hold the center of attention. A maker in the Detroit district has ordered 17 17-in. lathes, this transaction raising to a total of 24 the number of machines contracted for by this company in the last two weeks. Two other Detroit manufacturers have added new machine tool equipment, including drilling machines. From Sweden has come to a local builder an order for four special lathes. Railroads are a negligible factor in the market at the moment, while sales to companies in the general industrial field have been only fair in volume. The Central Railroad of New Jersey has closed for a 30-in. x 16-ft. heavy engine lathe.

Plans are being considered by Wilmington Ice Co., Wilmington, Ohio, for rebuilding plant recently damaged by fire, with loss of more than $25,000 including equipment.

Gummed Products Co., Troy, Ohio, manufacturer of paper goods, has awarded a general contract to A. E. Brown & Son, Troy, for a one-story addition, to cost about $35,000 with equipment.

Harris-Thomas Drop Forge Co., 126 Harshman Street, Dayton, Ohio, has let general contract to Danis-Hunt Co., Dayton, for a one-story addition, to cost approximately $25,000 with equipment.

Air Corps, Material Division, Wright Field, Dayton, Ohio, is taking bids until Feb. 10 for quantity of tools, including micrometer calipers, hacksaw frames, expansion reamers, welding torch, dies, files, etc., circular 206; until Feb. 21 for one bomb trailer, circular 209.

American Glanzstoff Corporation, 180 Madison Avenue, New York, will build a two-story steam-operated power plant, 66 x 112 ft., and 33 x 112 ft., and one-story machine shop, at its new rayon mill at Elizabethton, Tenn.; entire project to cost in excess of $1,500,000. Lockwood, Greene & Co., 100 East Forty-second Street, New York, are architects and engineers.

De Soto Paint & Varnish Mfg. Co., Memphis, Tenn., formerly De Soto Paint Mfg. Co., recently reorganized with increase in capital to $1,000,000, is arranging for expansion, including establishment of department for manufacture of lacquers. W. G. Saunders is president.

United Public Service Corporation, Chicago, has purchased Kentucky Power Co., Maysville, Ky., and affiliated interests operating in northern Kentucky, for about $6,000,000. New owner plans extensions and improvements, including transmission line construction.

Board of Trustees, Ohio State University, Columbus, is asking bids until Feb. 9, for construction of addition to power plant and completion of new chemistry building, to cost $300,000. Joseph M. Bradford, Brown Hall, Campus, is architect; William C. McCracken, Department of Public Works, State House, is engineer.

E. L. Bruce Lumber Co., Thomas Avenue, Memphis, Tenn., manufacturer of hardwood flooring, etc., has plans

for a one-story mill addition, 100 x 100 ft., to cost close to $40,000 with machinery.

Newman Mfg. Co., 418 Elm Street, Cincinnati, manufacturer of ornamental bronze and other metal products, has acquired former plant of Safe Cabinet Co., Norwood, with main unit, two stories, 100 x 600 ft., and four side wings, and will remodel for early occupancy. Present business will be removed to new location.

International Aircraft Corporation, Cincinnati, has been organized under Ohio laws to acquire assets and business of International Aircraft Corporation, Long Beach, Cal., latter company having been engaged in aircraft manufacture since 1909. New company has leased plant of Industrial Nitrate Co. at Ancor, Ohio, for establishment of works.

Nash Gas & Diesel Engine Co., 913 East Third Street, Dayton, Ohio, has been formed to manufacture gas and oil engines. It has secured local plant and also has arranged to do work by contract.

Gulf States

BIRMINGHAM, Jan. 30.

CONTRACT has been let to Mackle-Shepherd Co., 615 South Twenty-seventh Street, Birmingham, for one-story factory branch and distributing plant, 60 x 220 ft., in Smith Park section for Bates Valve Bag Co., 8200 South Chicago Avenue, Chicago, manufacturer of bag-filling machinery, to cost about $35,000.

Plans have been completed by Weslaco Machine Works, Weslaco, Tex., for establishment of a plant, and equipment will soon be installed in existing building. L. L. Crosby is president.

Montgomery, Ward & Co., Chicago Avenue, Chicago, operating a mail order business, has filed plans for an eight-story factory branch and distributing plant at Fort Worth, Tex., 220 x 360 ft., to cost $1,250,000 with equipment.

Sun Oil Co., Houston, Tex., is completing plans for development of sulphur properties in vicinity of Richmond, Tex., where more than 300 acres has been secured. Initial plant will cost in excess of $1,000,000 with machinery. A housing development for employees is being arranged. Benjamin Andrews will be chief engineer, in charge.

Travis Cottonseed Products Co., 303 East Fifth Street, Austin, Tex., has acquired 10 acres in vicinity of Corpus Christi, Tex., as site for a new cottonseed oil mill, to cost more than $60,000 with equipment.

Fire, Jan. 26, destroyed wagon works at State Penitentiary, Huntsville, Tex., with loss close to $25,000 with equipment. Prison Commission, Col. H. Walker Sales, head, plans to rebuild.

Houston Lighting & Power Co., Houston, Tex., is planning erection of a new power substation to cost close to $200,000 with equipment.

Valley Electric & Ice Co., San Benito, Tex., is completing plans for a new cold storage and refrigerating plant, on 10-acre tract, at Raymondsville, Tex., recently acquired, to cost close to $100,000 with machinery.

Chamber of Commerce, Clarksdale, Miss., is head of project to establish a plant for manufacture of face brick to cost more than $40,000.

M. L. Hampton & Associates, Congress Building, Miami, Fla., architects, have filed plans for a two-story municipal automobile service, repair and garage building, 185 x 245 ft., to cost close to $100,000 with equipment.

Findlater Hardware Co., Chadbourne Street, San Angelo, Tex., has plans for a new storage and distributing plant, 76 x 180 ft., to cost approximately $50,000 with equipment. A. F. Korn and B. M. Morgan, Thomas Building, Dallas, Tex., are associated architects.

Lone Star Gas Co., 1915 Wood Street, Dallas, Tex., has awarded general contract to Austin Co., Linz Building, for a new storage and distributing plant, with meter shop, automobile service and garage department, to cost about $75,000 with equipment.

Crawford Auto Shop, Inc., 2227 First Avenue, Birmingham, has plans for a two-story service, repair and garage building, 140 x 150 ft., to cost approximately $100,000 with equipment. William L. Welton, American Trust Building, is architect.

Rapid Battery Mfg. Co., 1401 James Street, Waco, Tex., will proceed with erection of two-story plant, 70 x 112 ft., to cost about $18,000 with equipment.

Hidalgo Utilities Co., Hidalgo, Tex., has secured a franchise and plans installation of an electric light and power house, and ice-manufacturing plant. A. Y. Baker, Edinburg, Tex., is president.

Galvanizing & Plating Co. of Texas, 3205 Engelke Street, Houston, Tex., has begun operation of its plant for hot dip galvanizing of sheets, plates and structural materials. It is equipped to do commercial galvanizing in any quantity.

Climax Engineering Co., Clinton, Iowa, has appointed Equitable Equipment Co., 410 Camp Street, New Orleans, its sales and service representative in lower Louisiana and Mississippi.

Cleveland

CLEVELAND, Jan. 30.

SALES fell off the past week, dealers reporting very few orders and not much new inquiry. However, reports from some manufacturers are more encouraging. A local manufacturer of turret lathes continues to take a good volume of business in orders for one or two machines and states that January sales will be the largest of any month in two years. This is partly due to business brought out by the recent price advance, although many orders have been at the new prices. Reports from Detroit indicate a moderate amount of orders for single machines or small lots from the automotive industry.

Virden Co., division of Gill-Virden Co., Philadelphia, formed about a year ago by merger of Virden Co. and Gill Brass Co., is moving from Cleveland to a new plant just completed in Philadelphia. Company manufactures lighting fixtures.

Variety Machine & Stamping Co., 3406 Tate Avenue, Cleveland, is enlarging its plant by erection of an addition, 36 x 60 ft.

Plans are being completed by Steel Improvement & Forge Co., 5003 Windsor Avenue, Cleveland, for new works for drop forge production, to cost close to $100,000. It is understood that standard type units will be used and that no architect will be employed.

Ohio Valley Gas Corporation, Zanesville, Ohio, recently formed to take over and operate natural gas properties in southern Ohio and West Virginia, furnishing service to Hope Natural Gas Co., Zane Gas Co., Zanesville, and other interests, has arranged for bond issue of $1,800,000, portion of proceeds to be used for extensions and improvements, including pipe line construction.

Serugee Rubber Co., Akron, Ohio, John Hatfield, president, recently organized, is completing plans for a new factory at Atwater, Ohio, for manufacture of general rubber specialties, to cost more than $50,000 with machinery.

Cleveland Electric Illuminating Co., Illuminating Building, Cleveland, has filed plans for a four-story and basement power substation, 55 x 125 ft., to cost approximately $100,000 with equipment.

General Tire & Rubber Co., Akron, Ohio, is disposing of a preferred stock issue of $3,500,000, a portion of fund to be used for expansion.

Ice & Fuel Co., Youngstown, Ohio, Paul Hunt, president, is completing plans for a new electrically-operated ice-manufacturing plant, to cost about $120,000 with machinery.

Henn Motor Sales Co., 1290 West 117th Street, Lakewood, Ohio, has awarded a general contract to Austin Co., Cleveland, for a one-story service, repair and garage building, 70 x 185 ft., to cost close to $100,000 with equipment.

Arcade Garage Co., Akron, Ohio, has plans for a four-story service, repair and garage building, 132 x 135 ft., to cost approximately $250,000. Starrett & Van Vleck, 8 West Fortieth Street, New York, are architects.

St. Louis

ST. LOUIS, Jan. 30.

BIDS will be asked at once by Curtiss-Robertson Aircraft Corporation, Bridgeton, Mo., for one-story plant on local site, for manufacture of commercial airplanes and parts, to cost $100,000 with equipment. Company is affiliated with Curtiss Aeroplane & Motor Co., Buffalo, N. Y., and Robertson Aircraft Corporation, Bridgeton. McDonald & Condie, 502 North Taylor Street, St. Louis, are architects.

Ramsey Accessories Mfg. Co., 4375 Duncan Avenue, St. Louis, manufacturer of automobile equipment, has awarded general contract to Atlas Construction Co., International Life Building, for one-story top addition to present factory, 40 x 180 ft., to cost about $25,000 with equipment.

Shampaine Aseptic Furniture Co., St. Louis, operated by A. S. Aloe Co., 1819 Olive Street, has leased portion of building at 1222 Chouteau Avenue, and will establish new plant for manufacture of metal beds and metal furniture.

John F. Brewer, Mountain View, Ark., plans extensions and improvements in local steam-operated electric power house, to include installation of engine, generator and accessory equipment.

Board of Education, Kansas City, Mo., is considering construction of central power station and heating plant to cost close to $100,000 with equipment.

Board of Public Service, St. Louis, is asking bids on general contract until Feb. 14 for one cast iron surge tank, contract 2985; for zeolite water softener, contract 2986; and for one deaerating feed-water heater, vent condenser and auxiliaries, contract 2987. O. D. Tillay is secretary.

Common Council, Kennett, Mo., is considering installation of municipal electric light and power plant, to cost $25,000 with equipment.

Arkansas Cold Storage Co., Little Rock, Ark., is arranging for erection of three-story addition to ice and refrigerating plant, to cost $90,000 with equipment.

Board of Education, Dodge City, Kan., is planning installation of manual training equipment in new three-story and basement high school to cost $250,000, for which bids have been taken on general contract. Mann & Co., Rorabaugh-Wiley Building, Hutchinson, Kan., are architects.

Wilson Power & Light Co., Wilson, Ark., is disposing of bond issue of $250,000, a portion of fund to be used for expansion and improvements, including transmission line construction.

L. J. Kent Boiler & Sheet Iron Works, Springfield, Mo., will build a new one-story plant, 75 x 150 ft., to cost about $40,000 with equipment.

D. M. S. Motor Repair Co., 2615 Warwick Boulevard, Kansas City, Mo., recently organized with capital of $100,000, plans operation of a one-story machine repair and parts works.

Public Service Co. of Oklahoma, Boston Street, Tulsa, contemplates extensions and improvements in ice-manufacturing plant at Grove, Okla., recently acquired, including installation of additional equipment. Transmission line will be built from Afton to Grove.

A. P. Green Fire Brick Co., Mexico, Mo., has begun enlargements in plant to increase capacity about 30,000 fire brick daily, to cost upward of $200,000 with equipment.

Detroit

DETROIT, Jan. 30.

PLANS are being completed by Superior Foundry Corporation, Grand Rapids, Mich., for a one and two-story foundry, 75 x 175 ft., to cost close to $100,000 with equipment. Wernette & McCarthy, Houseman Building, are architects.

City Commission, Grand Rapids, Mich., plans installation of pumping and power equipment, boiler plant, etc., in connection with a sewage disposal plant. Entire project will cost $1,500,000. Financing will soon be arranged.

Douglas & Lomason, 5836 Lincoln Avenue, Detroit, manufacturer of hardware products for automobile bodies, contemplates purchases of forgings and castings, brass, aluminum, sheet steel and other raw materials during next few months.

Jackson Steel Products Co., division of General Motors Corporation, Jackson, Mich., will occupy former local plant of Kelsey-Hayes Wheel Corporation, recently acquired, for production of steel stampings.

Johnson Motor Sales Co., 711 North Saginaw Street, Flint, Mich., has plans for a two-story and basement service, repair and garage building, 70 x 125 ft., and will soon take bids on general contract. MacKenzie & Pratt, Genesee County Savings Bank, are architects.

Oakland Motor Car Co., Oakland Avenue, Pontiac, Mich., is completing plans for a four-story and basement addition, 130 x 200 ft., to cost close to $200,000 with equipment. Albert Kahn, Marquette Building, Detroit, is architect.

Following erection of initial building for its new plant now in progress, Michigan Fertilizer Co., Lansing, Mich., will build a second unit, one story, 27 x 85 ft. Another structure for production of acid is also under advisement.

City Council, Ann Arbor, Mich., is planning a municipal airport, including machine and repair shops, hangars, storage and distributing buildings and other structures, to cost in excess of $100,000. G. H. Sandeberg, City Hall, is city engineer.

Board of Education, Pontiac, Mich., is planning construction of a new two-story and basement industrial arts school, with central steam power plant adjoining, to cost in excess of $325,000 with equipment.

Peter Smith Heater & Mfg. Co., 6209 Hamilton Street, Detroit, recently formed to succeed Peter Smith Heater Co., plans erection of a one-story addition early in the spring, adjoining present plant at Fordson, designed for heater division, which will be removed from present works at 1230 Wilbor Street, following completion. Company is arranging to expand operations and will operate division for manufacture of pressed steel parts. Heater division will be devoted to production for steam railroads and electric cars. Zeno C. Wilkinson, formerly connected with Youngstown Pressed Steel Co., Youngstown, has recently become vice-president and director.

Quartermaster Department, Washington, plans a one-story mechanical and repair shop at Selfridge Field, Mich., and new equipment storage and distributing plant, to cost $85,000. It is understood that bids will be asked late in spring.

Canada

TORONTO, Jan. 30.

WHILE large lists are absent from the machine tool market, a steady flow of orders is being received by builders and dealers for one, two and three tools. Industrial companies in all parts of the Dominion are extending their operations and many have plant additions under way or contemplated. Some improvement is noted in sales to the automotive industry, particularly garages and repair plants. While some large orders have recently been closed from mining interests in northern Ontario and Quebec, it is understood that inquiries in dealers' hands indicate a continued strong buying movement from this source.

Horton Steel Works, Ltd., Bridgeburg, Ont., has plans for an addition, 98 x 305 ft., of reinforced concrete to cost $50,000. New equipment will be purchased. Company manufactures ore bins, boiler breechings, tanks, etc.

Machine shop at Beaverton, Ont., owned by Smith Brothers, was destroyed by fire Jan. 24, with loss to building and equipment estimated at $10,000.

Standard Steel Construction Co., 55 Main Street East, Welland, Ont., will build an addition, one and one-half stories, 30 x 50 ft.

American Cyanamid Co., Stanley Street, Niagara Falls, Ont., has started foundation work on a $200,000 addition, to include a melting plant, 60 x 125 ft., and cooling plant, 60 x 82 ft. Standard Steel Construction Co., Welland, Ont., has contract for structural steel.

J. N. Coupal, Plantagenet Springs, Ont., will start work in spring on installation of a power development plant on Nation River to cost $30,000.

Western Canada

Application has been made by Calgary Power Co., Calgary, Alta., to develop two more power sites on Bow River, between its present Horseshoe Falls plant and Calgary. G. A. Gaherty is managing director.

Northern Light & Power Co., Estevan, Sask., is contemplating power development to cost $5,000,000. Plans call for erection of a station near Estevan where power can be developed from lignite coal.

Pacific Coast

SAN FRANCISCO, Jan. 25.

PERMISSION has been granted Sacramento Pulp & Paper Co., Sacramento, Cal., H. D. Wagnon, 1038 East Tenth Street, North, Portland, president, to issue securities in amount of $500,000, proceeds to be used for new pulp and paper mill in vicinity of Sacramento.

Southern California Edison Co., Los Angeles, is planning extensions and improvements in plant and system at Tulare and vicinity, to cost $325,000. Similar work will be carried out in Santa Barbara territory, to cost about $250,000.

Pacific Fruit Express Co., 65 Market Street, San Francisco, has awarded general contract to Lynch-Cannon Co., Chapman Building, Los Angeles, for one-story ice-manufacturing plant at Fresno, Cal., to cost upward of $500,000 with machinery. Company has taken option on about 200 acres at Tucson, Ariz., as site for ice-manufacturing and cold storage plant, to cost more than $650,000 with equipment. Engineering department is in charge.

Water and Power Commission, 207 South Broadway, Los Angeles, is asking bids until Feb. 28 for electric generators, exciter generator, transformers and auxiliary electric equipment, and hydraulic machinery for municipal power department. James P. Vroman, secretary.

Illinois-Pacific Glass Co., Fifteenth and Folsom Streets, San Francisco, is completing plans for new works at Vernon, near Los Angeles, where 8-acre tract is available, to cost $700,000 with machinery. It is expected to begin work in about 60 days.

Pacific Can Co., 290 Division Street, San Francisco, has begun grading for a new one-story plant, for which superstructure will soon begin, to cost $400,000 with machinery. L. H. Nishkian, Monadnock Building, is engineer and manager of construction.

Great Western Power Co., 530 Bush Street, San Francisco, has acquired about 35 acres near city as site for a steam-operated electric generating plant, with initial capacity of 35,000 kw., to cost upward of $750,000. It will be equipped to use oil fuel. McClellan & Junkersfeld, Inc., 60 Trinity Place, New York, is engineer.

City Council, Sand Point, Idaho, is considering installation of a municipal hydroelectric generating plant on Priest River, where site has been secured, to cost $175,000. H. A. Sewell, Interstate Engineering & Construction Co., Newport, Wash., has submitted estimates of cost.

Southern Pacific Railroad, Eugene, Ore., has awarded contract to H. E. Wilder, Eugene, for a one-story machine shop, 200 x 200 ft., at its local engine terminal, to cost $250,000 with machinery. Two craneways will be built. E. L. King, Pacific Building, Portland, is division superintendent.

Bunting Iron Works, Inc., 820 Parker Street, Berkeley, Cal., is considering erection of a one-story plant, to cost more than $70,000 with equipment.

Faegol Motors Co., Oakland, Cal., manufacturer of automobiles, is arranging for a note issue of $600,000, a portion of proceeds to be used for expansion and financing.

Idaho Power Co., Boise, Idaho, is reported planning construction of a hydroelectric generating station on Snake River, near American Falls, Idaho, to cost $1,700,000 including transmission lines.

Ornamental Iron Works, 900 Republican Street, Seattle, will erect a new one-story building, 64 x 100 ft.

Everett Marine Ways, Everett, Wash., has under construction a machine shop adjoining its welding department. Harold J. Durham is president and manager of company.

Iron Fireman Mfg. Co., Portland, Ore., will soon begin construction of an addition to its plant on East Seventeenth Street.

Foreign

PLANS are being considered by National Argentine Oilfields, Enrique Mosconi, director-general, a department of Government of Argentina, Buenos Aires, for additions and improvements in its oil refinery at La Plata, to include installation of new machinery for cracking and other operations, to cost $900,000. Plant has present capacity for handling 2000 tons crude oil per day.

Synthetic Ammonia & Nitrates, Ltd., Billingham-on-Tyne, near Newcastle-on-Tyne, England, branch of Imperial Chemical Co., Ltd., London, has plans for two new units with capacity of 50,000 tons of nitrogen per year, to cost more than $5,000,000 with machinery. Expansion is scheduled for completion early in 1930.

Municipal Council, Bydgoszoz, Pomerania, Prussia, Germany, has negotiated a loan of 3,000,000 francs (about $600,000) for extensions and improvements in its power facilities. A new plant will be built, to be equipped with two turbo-generator units of 3500 and 3000-kw. capacity respectively, and scheduled for completion by end of year. Present station will be used for reserve.

Pan-American Petroleum & Transport Co., 120 Broadway, New York, is considering construction of a new oil refinery in Venezuela, with initial capacity of about 75,000 bbl. per day, supplementing an existing refinery of Lago Oil & Transport Co., a subsidiary, near Maracaibo. Thomas Cook is general manager of manufacturing and refining.

City Administration, Riga, Latvia, has authorized plans for a new municipal electric power house and estimates of cost will soon be made. American Consulate, Riga, McCeney Welich, vice-consul, has information regarding project.

A company has been formed to take over Halda Aktb., manufacturer of Halda typewriters, with main factory at Svangsta, Sweden, with capital not less than 200,000 crowns, nor more than 600,000 crowns ($54,000 and $162,000). Plant has been closed for some time and new company contemplates early resumption of manufacture, with installation of additional equipment. American Consulate, Stockholm, Sweden, is understood to have information regarding project.

A sugar manufacturing company at London, England, has acquired property in Chichester district as site for a beet sugar refinery to cost about £400,000 (about $2,000,000). Information at Bureau of Foreign and Domestic Commerce, Washington, reference England, 35-X; also at American Consulate, London, William L. Cooper, commercial attaché.

NEW TRADE PUBLICATIONS

Preheaters.—Gradon Mfg. Co., East Tioga and Memphis Streets, Philadelphia. Folder 710 of 4 pages is devoted to preheaters in the construction of which considerable welding work is done. Standard dimensions and list prices are given for 27 sizes. The units are made both horizontal and vertical.

Ash Gates and Accessories.—Atlas Conveyor Co., 20 South Fifteenth Street, Philadelphia. Bulletin of 8 pages illustrating and describing ash gates of various types for use with furnaces fired by stokers, or otherwise. One type features ashes from pulverized fuel. An ash quencher is described, also.

Combustion Control.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Pamphlet of 8 pages reprinting an article from *Combustion*. It deals with fuel control by means of meters of the recording type.

Magnetic Brakes.—Cutler-Hammer Mfg. Co., Milwaukee. Bulletin P-38 of 20 pages. Illustrated description of magnetic brakes, with dimension and clearance drawings, together with specifications of various types suited for a wide variety of purposes. Illustrations are largely of installations, one showing a brake on a blooming mill manipulator finger, at the Inland Steel Co.

Steam Generation.—Combustion Engineering Corporation, 200 Madison Avenue, New York. An 8-page paper by Martin Frisch, dealing with aims and tendencies in steam generation and combustion engineering. Illustrations include cross sections of large generating units, diagrams of performance and illustrations of special equipment to improve performance. Higher steam pressures, higher boiler capacities and higher combustion rates are mentioned as present trends.

Cutter Grinder.—George Gorton Machine Co., Racine, Wis. Form 1090 of 4 pages illustrates and describes a cutter grinder, especially suited to the grinding of small mills, drills and engraving machine cutters. It is operated by a fractional horsepower motor, running at 5000 r.p.m. for the ⅛ hp. or 3400 r.p.m. for the ⅙ hp.

Belting.—F. Raniville Co., Grand Rapids, Mich. Belting manual, 3½ by 5½ in., 48 pages. In addition to price information and data relating to the belting, mechanical leather specialties and other products of the company, pages are devoted to practical suggestions for flat belt users. Other pages list mechanical rules, hp. transmitted, types of belt drives, etc.

Turret Lathe Tooling.—Jones & Lamson Machine Co., Springfield, Vt. Attractive booklet illustrating standard turret lathe tooling on chuck work.

Small Tools.—Gairing Tool Co., Detroit. Booklet 8½ by 11 in., 16 pages, describing and illustrating multiple-operation cutters, spot facers, counter-bores, core drills, etc., as well as the company's fixtures for grinding and salvaging counterbores and core drills.

Woodworking Machinery.—Oliver Machinery Co., Grand Rapids, Mich. Catalog No. 24, 8½ by 11 in., 31 pages, describing the company's Junior line of portable woodworking machinery. The line includes tilting arbor saw benches, band sawing machines, jointers, hollow chisel mortisers, and sanders. Electric glue pots and heaters, babbitt pots, tool grinders and vises are among several other items described.

Branch Office Representatives of The Iron Age

Editorial

Chicago, Otis Bldg.....R. A. Fiske
Pittsburgh, Park Bldg.....G. F. Tegan
Cleveland, 1362 Hanna Bldg.....F. L. Prentiss
Cincinnati, 408 Union Central Bldg.....Burnham Finney
Boston, Park Square Bldg.....Gerard Frazar
Washington, 536 Investment Bldg.....L. W. Moffett

Advertising

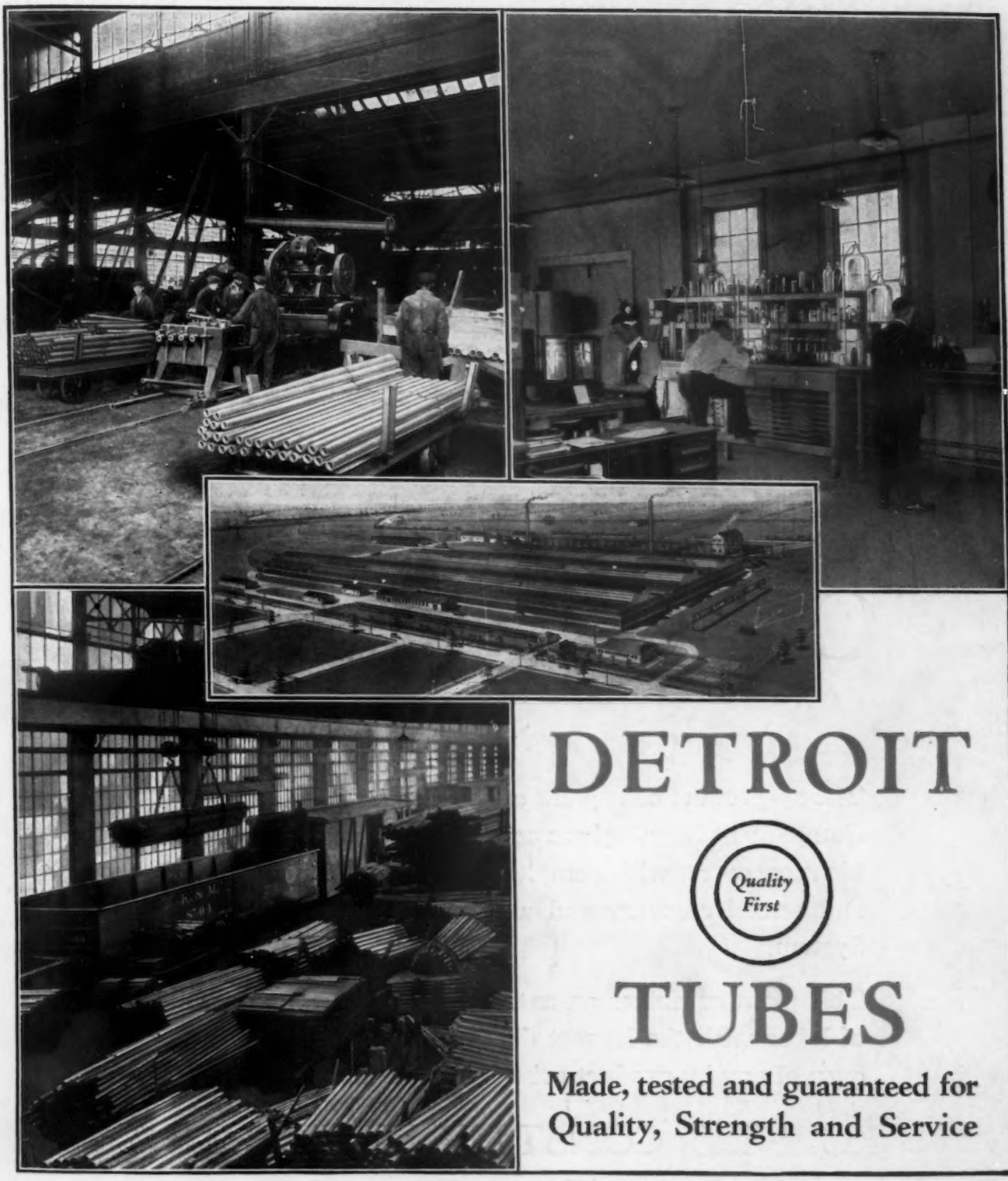
Chicago, Otis Bldg.....F. S. Wayne
Pittsburgh, Park Bldg.....W. B. Robinson
Cleveland, 1362 Hanna Bldg.....Emerson Findley
Cincinnati, 408 Union Central Bldg.....D. G. Gardner
Boston, Park Square Bldg.....H. E. Barr
Philadelphia, 1402 Widener Bldg.....Charles Lundberg
Buffalo, 835 Ellicott Sq.....B. L. Herman
Detroit, 7338 Woodward Ave.....Peirce Lewis
Hartford, Conn., P. O. Box 81.....D. C. Warren
New Jersey, Hotel East Orange, East Orange, N. J., W. C. Sweetser
New York, 239 West Thirty-ninth St., W. C. Sweetser, Chester H. Ober
San Francisco, 320 Market St.....W. A. Douglass

Mech Engin.
Library

FEB 10 1928

THE IRON AGE

FEBRUARY 9, 1928



DETROIT

Quality First

TUBES

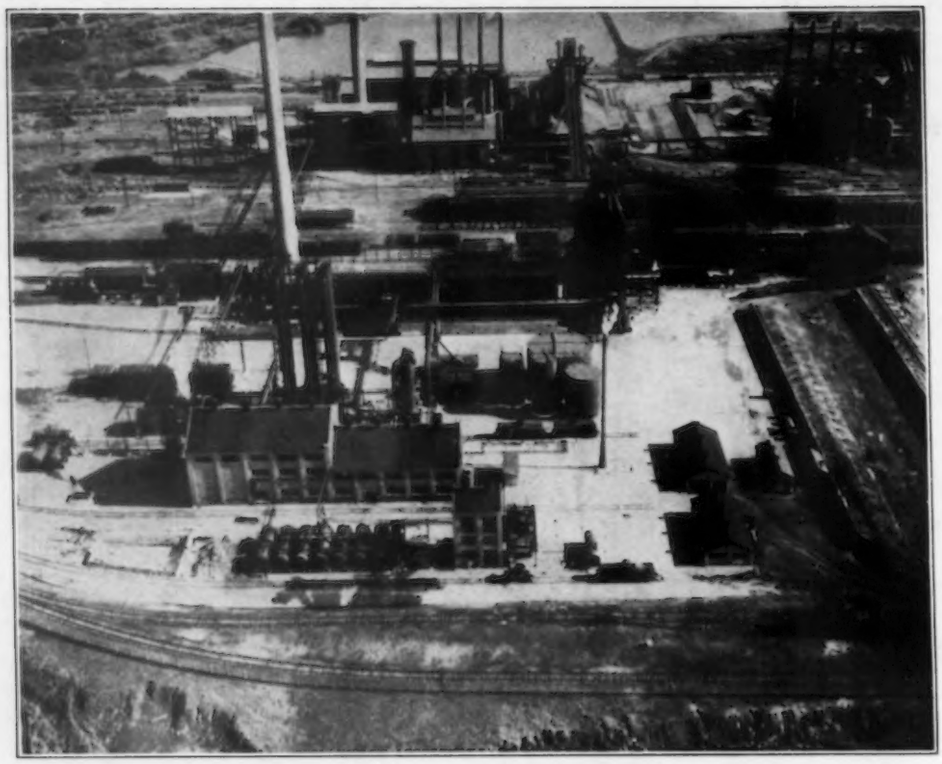
Made, tested and guaranteed for Quality, Strength and Service

Branches in New York, Chicago, Cleveland, Cincinnati

Detroit Seamless Steel Tubes Co.

J. W. HUBBARD, *Chairman* C. H. HOBBS, *President*

Mill and General Offices W. Warren and Wyoming Aves. Detroit, Michigan



Republic's BECKER TYPE OVEN PLANT... *at Birmingham*

The by-product coke plant of the Republic Iron and Steel Company at Birmingham consists of 57 Becker type combination ovens with complete equipment for by-product and benzol recovery and a Koppers Material Handling System.

This plant combines an extremely high output per unit of labor with the largest daily carbonizing capacity per oven of any by-product coke plant in America.

The KOPPERS CONSTRUCTION COMPANY

NEW YORK PITTSBURGH CHICAGO

THE IRON AGE

New York, February 9, 1928

ESTABLISHED 1855 VOL. 121, No. 6

Heat Treating Three Thousand Automobile Bumpers Daily

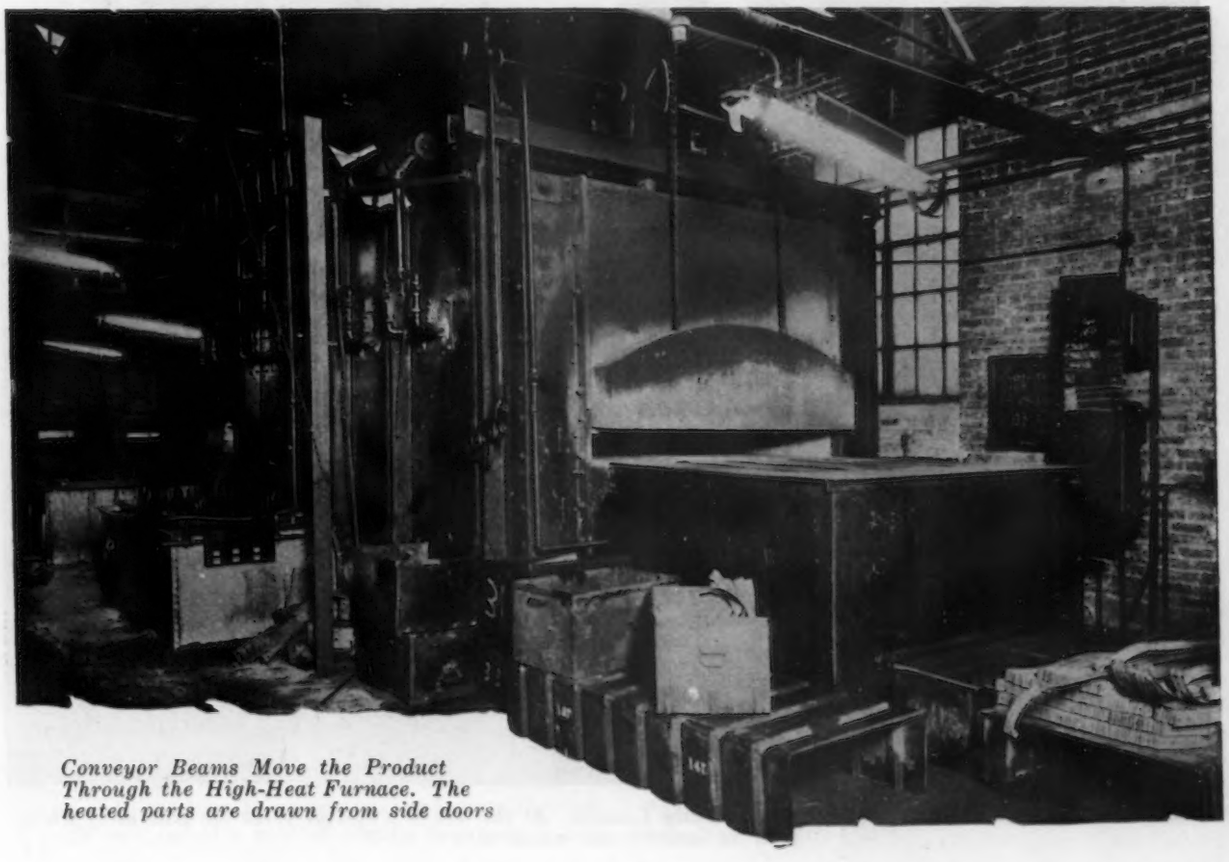
Furnaces Fired by City Gas Mixed With Air in Central Reservoir—Special Equipment Prevents Distortion in Quenching—Close Control of Temperature a Feature of Chicago Plant

BY ROGERS A. FISKE*

ACCURATE control of furnace temperatures for hardening and close attention to the rate of heating and the time for soaking have successfully brought about marked uniformity in the heat treating of 3000 automobile bumpers a day at the plant of the Stewart-Warner Speedometer Corporation, Chicago. The equipment includes two special conveyor-type, gas-fired furnaces, one for hardening and one for drawing. In the former, temperatures are automatically controlled within limits of 10 deg. Fahr. A conveyor system sets the pace for the progress of the material, and the character of the equipment is such that a high degree of skill is not required of the furnace operators.

Simplicity of the layout is an impressive feature. The furnaces are parallel to each other so that parts that have been heated in the hardening furnace and then quenched are transported across an aisle to the

*Western Editor THE IRON AGE, Chicago.



Conveyor Beams Move the Product Through the High-Heat Furnace. The heated parts are drawn from side doors

entering end of the drawing furnace. The operators have ample floor space on which to perform their duties, and the aisles are wide enough to facilitate repairs to the furnaces. The flow of the product is uniform, so that it has not been necessary to provide storage on the floor of the department for parts undergoing heat treatment. The conveyor in the drawing furnace, which is of the chain grate type, extends beyond the discharge gate. As each bumper part comes into view, it is removed by hand and placed with a minimum of motion on a conveyor that delivers it to the grinding and plating departments.

Fuel and Air Mixed in Central Plant

City gas of 530 B.t.u. per cubic foot is used for practically all of the heat-treating operations. To assure a non-oxidizing flame, the gas is mixed with air in a central plant. The proportions are one part of gas to one and one-half parts of air. Furnace operators therefore require little or no knowledge of the principles of combustion, inasmuch as the amount of air content necessary to support combustion is regulated for them. In the gas-mixing department are several compressors, which raise the air-gas mixture to a pressure of 25 oz. per square inch for distribution throughout the plant.

Shears used for cutting stock to the proper length, together with heating furnaces and presses, are located in a room adjacent to the heat-treating department. After being pressed into form, bumper bars, springs, bracket parts and bumperettes are delivered to the operator in charge of feeding the hardening furnace. The conveyor on this furnace projects beyond the feed door, so that the operator works under favorable conditions insofar as radiant heat from the furnace is concerned.

The high-heat or hardening unit is of the conveyor-beam type, i.e., the bar stock is fed into and through the furnace by means of four beams operating through slots in the hearth of the furnace. The principal feature of the conveyor beams is that they are tile-covered; hence no metal projects into the furnace or is subjected to heat.

The motion of the beams is obtained through a cam and crank mechanism, the cams raising and lowering the beams and the transverse motion being obtained through the crank action. The mechanism is so designed that there is no forward or backward travel of the beams during the raising or lowering period. This insures a true rectilinear motion and prevents the material from dragging on the hearth of the furnace, which would tend to wear out the hearth or distort the plates carried on the beams.

The beams are built of heavy structural shapes, on top of which are clamped the insulation and tile which project into the furnace. The beams are carried on heavy flanged rollers and rocker arms, and approximately 80 per cent of the weight of the beams themselves is counterweighted. All the operating mechanism is under the furnace, where it is accessible for oiling and for repairs.

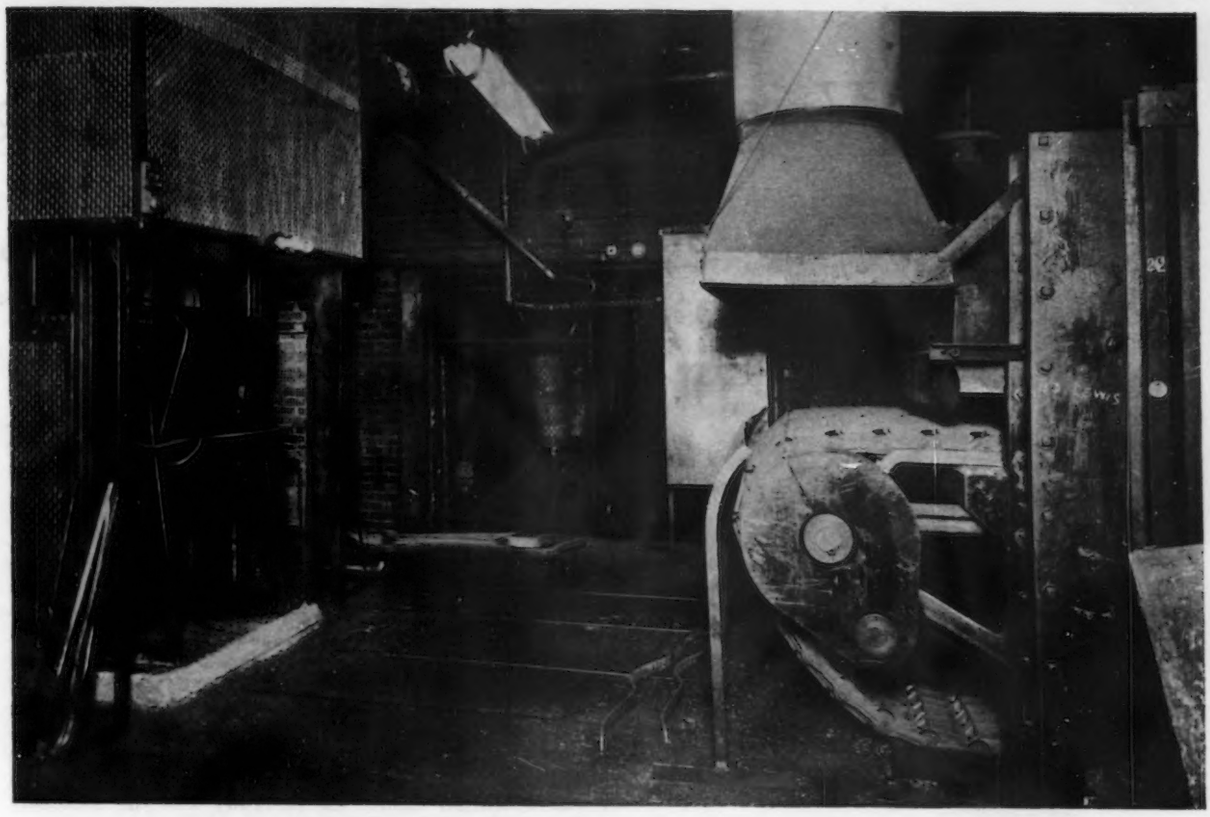
Overhead Combustion Chamber Insures Uniform Heat

The furnace is constructed with an overhead combustion chamber, separated from the work chamber by a perforated arch, which acts as an accumulator and distributer for the heating gases. The gases are withdrawn from the furnace by means of flues in the side walls, which connect with cross flues under the hearth. This arrangement assures a thorough circulation of the heating gases under the hearth floor and around the beams.

As previously mentioned, this unit is fired with city gas, the burners being arranged in pairs. Each pair of burners is set at an angle so that the flames converge as they enter the combustion chamber. One burner on each pair is controlled by means of a Dixon valve through a Leeds & Northrup recorder controller and thermocouple located in the work chamber immediately under the burners. With this arrangement one burner of each group is running constantly while the other burner is used for control and is either on or off, as the heat condition in the furnace demands.

Parts being heat treated are brought up to 1710 deg. Fahr. during their travel through three-fourths of the length of the furnace, allowing one-fourth of

Water Jacketed Quenching Vats Are Conveniently Located. At the left is a special press the platens of which can be lowered into an oil bath



A Chain Conveyor Transports Bumper Parts Through the Drawing Furnace

the travel time for soaking. The temperature is controlled within 10 deg. Fahr. The length inside of the furnace is 22 ft., and the time of travel through the furnace is 20 min., giving a rate of slightly more than one foot a minute.

Special Press Prevents Distortion During Cooling

Not all parts are completely formed before passing through the high-heat furnace. Therefore a hydraulic press is located near the discharge end of that furnace. The heated parts are drawn through side doors at the end of the furnace, and, if they have already been formed, they are immediately quenched. If additional press work is necessary, the piece is placed, while hot, in the hydraulic press. After the dies have been closed, the platens are lowered into a vat of oil. In this way the part cools while being held by the dies, and distortion resulting from cooling is avoided.

Parts that do not require press work after heating are removed from the furnace and cooled in oil tanks, one of which is located at each side of the furnace at the discharge end. The oil is agitated by a motor-driven pump, by means of which it is delivered to a radiator-type cooler located on the roof of the building. Normally the temperature of the oil bath is held below 100 deg. Fahr. The oil tanks are water-jacketed.

A monorail air hoist is used to transfer the hardened product from the oil drain boards to the draw furnace, which is of the under-fired three-quarter muffled type. It is equipped with a continuous chain grate type of conveyor for handling the work. The conveyor consists of three strands of extra heavy malleable iron roller chain, upon which are mounted especially designed malleable iron interlocking flights. The return strand is directly underneath the furnace, where it is protected from rapid cooling action so that it returns to the furnace well up to heat. This furnace is likewise fired by gas burners, arranged in pairs and controlled as on the high-heat furnace. The drawing temperature is maintained between 900 deg. and 1000 deg. Fahr. The inside length of the furnace is 23 ft. 7½ in., and the time of travel of a single part through it is 25 min., or at a rate of slightly less than a foot a minute. Maximum temperature of the part is reached about 5 min. before it is discharged from the furnace.

Both furnaces have extra-heavy fire brick walls, and they are insulated with 4½ in. of cork insulation brick. The conveyors are driven through fully inclosed spur and worm gear speed reducers, direct-connected to motors. Both furnaces were built by the McCann-Harrison Corporation, Cleveland.

As each part is taken from the conveyor bed of the drawing furnace it is closely inspected for defects and is subjected to a hardness test. If it meets specifications, it is placed on the conveyor for delivery to the grinding room.

Novel Use of Swing Grinders

A point of interest in the grinding room is the use made of swing grinders for finishing the flat surfaces of bumper parts. Opposite each grinder is an oscillating table provided with an automatic ratchet device which gives the table a lateral motion. A number of the bumper parts are secured to the table, and the swing grinder is lowered. Power is applied to the table, which moves backward and forward in a plane at right angles to the axis of the grinding wheel. When the table reaches the end of its travel in one direction and stops momentarily, preparatory to moving in the opposite direction, it is ratcheted to one side so that the grinding wheel will not retrace the path it has just been working on.

A 6500-hp. reversing blooming mill motor for the South Works, Illinois Steel Co., and a 4600-hp. reversing roughing mill motor for the Tata Iron & Steel Co., Jamshedpur, India, will be furnished by the Westinghouse Electric & Mfg. Co. Each order includes a motor-generator set and switching equipment.

The Lake Superior Mining Institute will hold its twenty-sixth annual meeting in the Oklahoma-Kansas-Missouri zinc-lead field upon invitation of the Tri-State Zinc and Lead Ore Producers Association. The tentative date is April 1 to 6.